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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, JULY 7, 1883.

VOLUME XLVII Number 1.

Beach Mining For Gold.

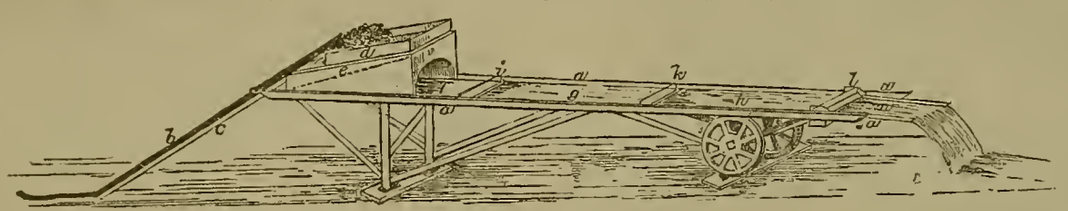
In the last number of the Press we gave a brief description of the beach mining for gold in Australia. We give in this issue an engraving of the machine there used. It is said to be successful, and as we have many gold beaches on our coast, perhaps this machine might be successfully introduced here. Warden Revell, a resident of the locality where this system is carried on, thus describes the machine:

The illustration is a sketch of a "beach-box," which is a fair representative of those now in use. The frame *a* is built entirely of timber, and from end to end measures fourteen feet. The hind legs are two feet high, and at the lower end the floor is eighteen inches from the ground. The fall is regulated by raising the legs or wheels, as may be necessary. The "hose" *b*, is three inches in diameter, made of stout canvas, generally tarred to preserve it and render it water-tight — through which the water is brought and carried up the "leader" *c*, thence emptying into the "hopper" *d*. The bottom of the hopper is a sheet of perforated iron, two feet square the size of the hopper. The perforations are one-fourth of an inch in diameter, and generally about one inch apart. The sand is shovelled into the hopper, and the finer part of it is carried through the perforations by the water, and drops upon the "slide" *e* (shown on the sketch by dotted lines), within the box below the hopper. A copper plate is laid over this slide, coated with mercury, to which the gold attaches itself. This slide is two feet wide and three feet long. At its lower end an opening is left two inches from the plate beneath it, and the same space from the end of the box, so that the water may drop on the next plate, *f*, and from that over the plates *g* and *h*, which are also overlaid with mercury. At the bottom of plates *f*, *g*, *h*, "rifles," *i*, *k*, *l*, are placed; *i* and *k* are formed by leaving a space between the plates, so as to form a hollow into which the water must drop before reaching the next plate. Above these two rifles slides are placed to break the impetus of the water when it reaches them, and force it more gently under them. The last rifle-box is of different construction from those above. It is five inches in depth at the upper side, thirteen inches in the lower, and five inches wide. In the center a slide is placed, and pushed down to within two and a half or three inches of the bottom of the rifle-box. The sand and water drop into this box, and are forced out again at the lower side of the "slides," thence running over the last table, or "tail-board," *m*. The object of the two first rifles is to break the force of the water, and that of the rifle-box is to catch any loose mercury that may come off the plates above it, and which on account of its weight, cannot be forced out again by the water. On the "tail-board," instead of mercury, "baize" or blanket is placed to catch all "rusty" gold that the mercury will not take. On the lower side of each rifle a "flange" is nailed so as to overlap the plate below, and thus prevent the water passing beneath. The plates are secured to the frame by battens, and are nailed at top and bottom. Each plate usually weighs about 14 pounds.

When sufficiently rich, the plates are taken from the frame and set on end, so that the loose mercury may run off. They are then scraped with a chisel, both gold and amalgam being taken off.

After all the mercury possible has been squeezed from the amalgam, the latter is retorted in the usual manner to free the gold of the mercury entirely. Should any of the copper have been scraped off with the mercury, it will remain with the gold, which latter has then to undergo the process of refining at the bank.

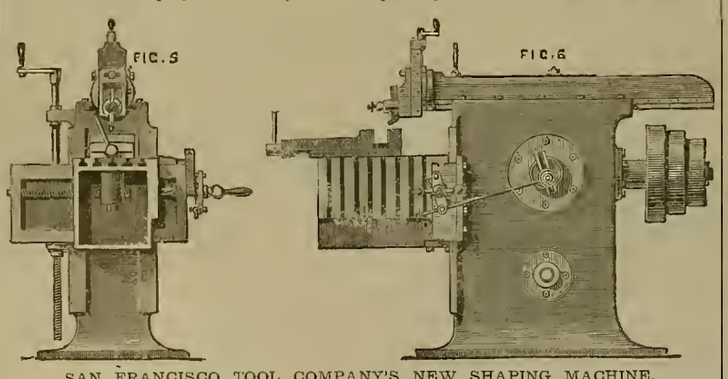
The working results of these claims are various and almost impossible to estimate, the beaches being often unworkable for months, for it is only heavy seas and strong winds that bring payable gold upon them. Revell thinks, however, that the average wages throughout the year would not be less than 2l. 10s. per week.



APPARATUS USED FOR GOLD BEACH MINING IN AUSTRALIA.

New Shaping Machine.

The machine here shown is among the late machines produced at the works of the San Francisco Tool Company. It has a quick return and a stroke of twelve inches. The table lowers to receive twenty-four inches. The tables have horizontal and vertical faces, and are provided with revolving vise boxes, or plain clamp vises, as shown above. They are strong, substantial tools, and in every way suited for the rough use such machines usually have to endure.



SAN FRANCISCO TOOL COMPANY'S NEW SHAPING MACHINE.

Work is now being resumed on many of the base ore prospects along the range between Pioche and Bristol. The prevailing idea that the Day furnace will resume work at no distant day is the cause of it.

Secretary Teller has recently decided that applicants for mineral patents may designate the name of the paper in which they desire the advertisement of such application to be published.

Test Silver for Blowpipe Use.

The silver used for both qualitative and quantitative examinations by the blowpipe must be chemically pure to enable the operator to make accurate and reliable assays for either gold or silver. For convenience, it is best to have the silver in two forms, one in the shape of an ingot, say about 1½ inches long and ¼ inch square: the other should be in thin foil, which latter may be found most useful in the gold assay.

If chemically pure silver cannot be procured from a reliable source, such as a mint, a first-class laboratory or assay office, George Attwood, in his "Practical Blowpipe Assaying," gives directions for preparing it as follows: Dissolve the purest silver that can be obtained in weak nitric acid, dilute with water, allow the solution to settle for several hours, after which decant carefully and reserve for use only the portions that are perfectly clear, to which add a solution of chloride of sodium (common salt) until the white flocculent clouds of chloride of silver cease to appear. The precipitation is then complete. Filter and wash the precipitate repeatedly in warm distilled water; then dry and fuse (in a new and perfectly clean crucible) with its own weight of crystallized carbonate of soda and about one-eighth of its weight of pure nitre. The heat should be applied gently at first, and finally raised to the fusing point of silver; and when cold, the crucible should be broken, and the button of silver carefully washed. The silver must be again dissolved in nitric acid, water added, the solution allowed to settle, and great care taken in decanting, as before. The silver is precipitated as before, and the precipitate repeatedly washed for twenty-four hours with warm distilled water. Dry, and again fuse with carbonate of soda. If this process is carefully carried out, the silver obtained will be found to be chemically pure.

Sir Michael Bass, of pale ale fame, has given £173,000 for popular institutions.

Advancement of Science.

The American Association for the advancement of Science meets at Minneapolis, Minn., on the 15th of August next. As considerable interest is manifested in this large association we make some extracts from its cases relating to the classes of members, patrons, etc.: Any person may become a member of the association upon recommendation in writing by two members or fellows, nomination by the standing committee, and election by a majority of the members and fellows present in general session. Fellows are nominated by the standing committee from such of the members as are professionally engaged in science, or have by their labors aided in advancing science. The election of fellows is by ballot and a majority vote of the members and fellows present in general session. Any person paying to the association the sum of $1,000 is classed as a patron, and entitled to all the privileges of a member and to all its publications. The name of any member or fellow two years in arrears for annual dues is erased from the list of the association, provided that two notices of indebtedness, at an interval of at least three months, shall have been given; and no such person is restored until he has paid his arrearages or has been re-elected.

The admission fee for members is five dollars in addition to the annual assessment. On the election of any member as a fellow an additional fee of two dollars is to be paid. The annual assessment for members and fellows is three dollars. Any member or fellow who pays the sum of fifty dollars to the association, at any one time, becomes a life member, and as such, is exempt from all further assessments, and entitled to the proceedings of the association. All money thus received is invested as a permanent fund, the income of which is used only to assist in original research, unless otherwise directed by unanimous vote of the Standing Committee. All members and fellows must forward to the permanent secretary, as early as possible, and when practicable before the convening of the association, full titles of all the papers which they propose to present during the meeting, with a statement of the time that each will occupy in delivery, and also such abstracts of their contents as will give a general idea of their nature, and no title is referred by the Standing Committee to the Sectional Committee until an abstract of the paper or the paper itself has been received.

Table Mountain Nickel Mines. — A Lovelock correspondent informs the *Silver State* that Bell, Curtis & Co., of San Francisco, have a number of men at work developing their nickel mines in Cottonwood canyon, Table mountain. They have several veins, from a foot in width upwards, that assay from twenty-five to forty-five per cent nickel, while the main lead is from twenty to 100 feet wide and carries from five to eight per cent of nickel. They are running a tunnel to crossent this ledge at the depth of 200 feet, and Mr. Bell, who is an experienced miner, is giving the matter his personal attention.

CORRESPONDENCE.

Howells—A New Town.

Walker District, Yavapai County, A. T.

[From our Arizona Correspondent.]

It was my privilege to-day to spend a few hours visiting the "Howell Smelting and Mining Co.'s" properties, situated at Lynx creek, twelve miles southeast of Prescott, the capital of Arizona, and also the county seat of Yavapai county.

This twelve miles has now an excellent hilly road, and the county has a large force of men working out a $15,000 appropriation for improving and extending this road through to the Black Canyon road to Phœnix, to shorten the mail route some fifteen miles between Prescott and Phœnix, and accommodate a rich and rapidly developing mining region with daily mail and freighting facilities. By this sensible move on the part of the Commissioners, they get a donation of the free use and ownership of fully 88,000 worth of graded roads, already made by John Howell, for the use of the Howell mines and smelting works. The additional labors of the county in extending the road will prove a great benefit and public convenience; and a few years' continuance of this good road policy, and the direct results and influences will more than double the resources of the county.

Last fall Mr. Howell was clambering about those pine-covered and rocky hills

To Make a Plant

For smelting and reduction works for the ore from the Belle Mine, situated beyond Lynx creek two and one-half miles, over high and rocky hills. He decided to plant the works on Lynx creek, and grade a road to the mines. The inconvenience and cost of lumber showed the economy of first erecting a sawmill, and cutting the pines growing near by for his building lumber.

But I hasten simply to mention some results of a very few months of well planned labor programme. There stands a thirty ton water jacket (Rankin & Brayton, S. F.) smelter; one eighty ton Howell cylinder rotary oxidizing furnace, to prepare rebellious ores for the smelter; a Wheeler crusher, of largest capacity; a small mill for reducing ore for accurate sampling; a steam engine of ample capacity to furnish the power for double the present plant. It would require a lengthy article to particularize, or even mention a small portion of the points of convenience secured by ingenious planniugs, positions and mechanisms, and even the most unshapely roughness of the location is used just as if it was intended and fashioned for a most perfect and

Labor Saving Reduction Site.

The steam engine moves the automatic combinations. The rock received from the teams on the upper terrace floor, falls into the crocodile jaws of the crusher that rapidly reduces it to the proper fineness or size, and it is thence automatically and regularly transferred to the rotary cylinder furnace, which revolves slowly as the heat passes through it. The cylinder is placed at a slight inclination, and as it revolves the ore within it is dropping from top to bottom and slowly passing downward toward the lower and hotter end, and gradually loosing its sulphur, arsenic, antimony and various properties that interfere with the most successful smelting.

This Howell Rotary

Was considered the greatest achievement of American success in the great problem of working the rebellious ores of Nevada, where it was used with eminent success as a chloridizer of the precious metals, and at the same time oxidizer of the base metals and thus preventing their being amalgamated, they were carried off with the tailings, and the dechloridized silver in the ore would then amalgamate and give from a base ore a result of fine bullion.

This one metallurgic achievement, in comparison with all the other devices calculated to attain the same results, stands out chief and alone, if viewed in its economic, healthful and successful records. This is one of the many silver ore machines that we take a special pride in, its being of Pacific coast origin, and one that every progressive mining nation will sooner or later adopt.

The smelter has been running now one month from 1st of May, has shipped crude bullion to amount of about $25,000 to Chicago by the A. P. R. R., sixty miles freighting by teams to depot at Ash Fork. The freight of nearly ninety tons of bullion out, and the coke brought in, amounted to 230 tons for this first month.

The Trinidad coke costs at furnace $36 per ton, but when the railroad now talked of, and surveyed, to Prescott, is completed (if ever), then the same coke would probably cost not over $16 per ton, and other expenses be reduced in similar proportion.

Improvements Making.

There is a large force of men employed in shaping the foundations for future and immediate additions. Another and larger water-jacket smelter beside the present one, and a stamp mill with pans, and settlers with Frue concentrators, will be immediately erected to dispose of a class of free-milling ores rich in gold and silver to better andvantage than by smelting and selling with lead bars. The concentrators will save the principal portion of the sulphurets, that are more or less seamed into the free-milling ores, and then these sulphurets will be passed through the smelter.

Refining and Reduction Works

Will also be put up, with cupel hearths to refine the base bullion, by converting the lead into litharge (oxyd of lead), and use that as flux for the furnaces, when needed, and bar the bullion, as fine silver and gold, instead of lead, as now shipped.

The sawmill attachment has now been disposed of, and the space utilized for extensive charcoal depository. This article is abundant, furnished at 15 cents per bushel.

The materials for these improvements are now mostly on the ground, and, when all is ready, will soon become a part of the plant. The great demand for supplies for the company and employes made it necessary early to lay in a large stock of such articles as are needed in such a camp. They order merchandise by full carloads, and thus get supplies at least possible cost, and from a bulletin board on the front of the store, I noticed some articles even 20 per cent cheaper than they were selling in the stores in Phœnix. The stock seemed of choice goods, and no bar attachment. But in this respect, the new town of "Howells" is amply supplied. As a miner counted them upon his fingers, he said: "There are nine whisky shops now in this camp." I have no space to moralize. The wise ones (saloonists) predict, of course, a great future for this camp. That a large amount of bullion from this and the many other less developed properties that must soon attract capital will make this a center for business, and hence their haste to set their traps early.

There are hundreds of smart business men who rely very much on the judgment of these saloon-men in making up an estimate of the future prospects of a locality. They certainly say by acts that this camp has backing. But I prefer to drop this and see where John Howell, our old Nevada youth of sober, steady habits and sound judgment, got his inspiration to make this wild plant far out among rocks and hills. So I will, or rather did, visit the mine that produces some of this hope I visited

The Belle Mine

Near Lynx creek, Walker district, Yavapa Co., expecting to find a hole in the ground several feet deep, etc. My open note to the mine foreman brought me in friendly relations with a nobleman, though dressed for his occupation of going anywhere in and about the mine, and entirely devoid of any official badge, except the square countenance of a thorough, reliable business miner. I am sorry I am prohibited by his request from mentioning his name. It would cheer many an old Comstocker and Eastern Nevada miner to know he is yet occupying a place of trust and responsibility, and enjoying the labors that make much for others' wealth. Having donned a miner's jacket and hat in the whim house, I took a lighted candle, and we proceeded to descend by a ladder in the shaft, all made firm and safe. All the way down as I faced the foot wall (but it was almost perpendicular), to my left was the ledge as it was broken off by the picks, gads and powder. It started at the surface small but gradually widened out to two feet or more, eye measurement, and this with slight wavings of the casings continued on down with us till we landed on the 105 level. We now pass through the tunnel, to the north, in the ledge, or the space which the ledge had occupied, and could inspect it every foot of the way overhead for 180 feet, to where we find the men driving on the tunnel. Here my guide took the hammer and gave some signal blows on the end or face of the tunnel, and they were quickly answered by rappings from a similar spirit on beyond us, who had started where the ledge outcropped on the hillside, and were aiming to connect with this tunnel; will speak of that again. The ore in this tunnel just passed over, is of a beautiful clean character, free from cab or waste of any kind, and a varied galena, with some elegant copper stainings, with oxide and carbonate of lead; in some portions it carries considerable free-milling gold and silver ore. Then from shaft and ladder, south, all the way in the continuous ledge 240 feet, brings us to the face of the tunnel and facing a beautiful full ledge. Some few stopings have been opened, which developed some very massive deposits of high grade smelting, and some free milling ores. Having thoroughly satisfied myself that every foot of drift here showed a very uniform and perfectly regular vein, we climbed slowly out, admiring what was glittering all the way up. Now, again on top, we go to the north and down the hill to the first tunnel going in on the end or edge of the ledge, toward the south ninety-four feet, all in the ledge same as we found in the tunnel, where we heard the raps from this open tunnel (soon to open into the other tunnel). Coming out we go down the hillside 100 feet more and enter the tunnel to connect with the 210 feet level as measured at the main shaft. This drift of 460 feet is all in ledge of same character, only gradually enlarging and improving, but of same character as above. This is the 210 feet level of the main shaft, which extends yet down to the 300 feet level, all the way in ledge and pay ore, regularly formed and gradually enlarging, as developed below. The entire work so far, is simply to show if it is a mine and to get tunnels with car tracks all ready for stoping out ore in a business way. As yet a simple whim with rope and bucket has sufficed to hoist for exploration developments. Now the machinery is on hand and the timbers hewn and sawed for a

First-class Hoisting Works

With wire cable and steam power—and the ore dump to be constructed with chutes for convenient loading of wagons. But while this work is being done ore sufficient to run the present furnace can be run out to the two tunnel dumps each having well graded roads for teams.

Mr. Howell has forgotten so far, all about exterior show. About the whole mine the only planed lumber is the ladder, and even his own family residence, in Howell, is free from all expensive show, and if my recollection is correct, I think it like the others, is yet of pine color, or unpainted and very plain. We had an excellent appetite for dinner, after finishing our explorations out and in the mine, and about 1:30 enjoyed dinner at the mine boarding-house, which was a fuller supplied table than the average of first-class hotels.

After dinner, retired to the foreman's office, a comfortable log cabin, where he enumerated his employes in and about the mine: Two cooks and table waiter, three packers, etc. The miners and graders in all amounted to 60 men. Wages for miners, $4 per day; others, $3.50 and $3; each paying $9 per week for board, unless they board themselves. There is quite an

Extensive Pay-Roll

Of workers at and about the smelter. This, with the many buildings being erected in the town, makes this one of the mining camps of old, especially when a dozen big freight and rock teams are encamped there for the night. All this stir comes from the faith of Boston capitalists in John Howell, and the faith that John Howell has in this Belle mine and other mines of Walker district. He was ready to back his faith by his own capital, and they acting largely on the faith in others' statements, invested, and now have the satisfaction of seeing a vast and successful wealth creating enterprise progressing.

In all my intercourse with the most practical business men, and those of mining and milling experience in this Territory and Nevada, I have never found one to speak disparagingly of Mr. Howell's skill and abilities, or any word derogatory to his character as an upright and thorough business man. Whatever may be the share owned by any distant partners, they have entrusted it in able and reliable hands, and from present appearances, nothing but some calamity can prevent their venture from that success which all in this vicinity prophesy and wish for it.

The Belle mine, though perfect in its dip, and a north and south true fissure vein containing within itself the requisite fluxes, and various favorable features, is by no means the solitary ledge of this district. I am told by disinterested parties that there are richer ores, and some other fine properties near by that await the arrival of capital to place them in paying position.

Maj. C. P. Dake, one mile above the Howell smelter, has a water-jacket smelter and reverberatory furnaces, also a good sawmill and several mines of good repute, but a financial embarrassment holds it back from successful operation at present.

Lynx creek has for years been mined in flood season for surface gold. Some good fortunes have been made here, and the wealth deposits are yet just being opened. B. W. CROWELL.

Prescott, A. T., June 1, 1883.

Wood River Bullion.

The Wood River *Times* of June 20th, says: The first freight destined for Omaha, via the Wood River Branch, the Oregon Short Line and Union Pacific railways, was received at Hailey on the 25th of May—about 15 days ago. Since that date the following shipments have been made:

BASE BULLION.

DATE.	BARS.	DATE.	BARS.
May 25	960	June 5	240
" 26	720	" 6	240
" 29	480	" 7	480
" 30	240	" 8	240
" 31	240	" 9	240
June 1	960	" 11	480
" 2	480	" 13	480
" 3	720		

Total, 720,000 pounds of base bullion.

The only company that has shipped ore to Omaha since the railway has been completed, is the Mayflower, which shipped as follows:

ORE.

DATE.	POUNDS.	DATE.	POUNDS.
May 31	68,000	June 7	24,000
June 2	48,000	" 8	48,000
" 3	24,000	" 9	24,000
" 5	24,000	" 12	24,000

Total, 284,000 pounds of ore.

The bullion carries an average of 300 ounces silver and 70 per cent. lead, and the ore averages 200 ounces silver and 70 per cent. lead per ton. The value of the shipments above given is therefore in the neighborhood of $177,000. If to this be added the value of the ore shipped by the Mayflower company since the first day of April of this year—about $90,000—it will be seen that the value of our ore and bullion shipments so far this year exceeds $265,000.

This, when the rate of freight on ore and bullion—$30 per ton—is taken into account, will be admitted to be a very good showing indeed.

The Silver King Mine at Calico.

The following is from the *Calico Print*, San Bernardino county: This mine is earning for itself a record that will eventually place it foremost among the rank of great mines on the Pacific coast. Up to the 1st of January last its progress was slow in its development, but since then it has made considerable advancement, and is now in excellent working order, and is turning out a good supply of bullion every week. Under the able management of Mr. A. Barber, the superintendent, assisted by Mr. Al. Waite, the foreman, the mine is worked in a systematic and careful manner, and is producing results that are quite satisfactory to all interested parties. We are indebted to the superintendent for valuable information concerning the condition of the mine, and to the foreman for his kindness in showing us through the various levels, and describing the characteristics of the ore deposits, and the veins that have been opened up, besides the different methods employed in all its operations. We were informed that Nadeau's ore teams, that haul the ore forty miles to the company's mills at Oro Grande, are supplied with twenty tons of free milling ore every day, and that the average milling returns per ton from the ore is $90. Up to date 3,200 feet of openings have been made in the mine since December, 1882. At present, forty persons are employed in and about the mine. In company with Mr. Waite, we ascended the steep hillside, while the thermometer was on tip-toe, and trying eagerly to reach 115° in the shade, but failing to force the quicksilver above 100°. When we reached the highest level the view of the landscape below and beyond was grand and interesting.

We first entered the first level at the west end. This level extends through the hill in a westerly and easterly direction, is 400 feet in length and at a depth of sixty feet from the summit. It follows the ledge from the foot wall. Eighty feet from the entrance a winze has been sunk to a depth of eighty-six feet, which contains ore from top to bottom. In this level there are fifty-four feet of crosscuts, and 250 feet of stopes, besides an upraise of fifty-five feet. A car track is laid nearly the whole length of the level, the waste rock being run out in the ore car to the mouth of the tunnel and dumped down the hill, while the ore is dumped down a chute to the second level, and from thence to the fourth level, where it is run out on the tramway to a large chute. In this level numerous rich pockets have been opened, some of the assays from which reached as high as $1348.

Along a considerable portion of the wall, which is on the north side of the level, no ore was uncovered; but on the south side drifts have been run in following veins that carry ore, assaying from a few dollars up to hundreds of dollars to the ton. We next passed along the second level which is in two hundred feet, which contains good milling ore its entire length at frequent intervals. We next examined the third level, which is in 650 feet, and has three upraises. No. 1 is thirty-five feet high; No. 2, 40 feet; No. 3, ninety feet; cross cut forty feet. Large quantities of ore have been taken from this level. We next entered the fourth level where we found considerable work had been done. The length of this level is 540 feet, and it runs in a north-westerly direction. It contains a cross cut of seventy feet and three upraises, the first sixty feet high, the second sixty feet, and the third twenty feet. Two winzes have been sunk; the first one to a depth of seventy-five feet, and the second sixty feet. In the fourth level, 200 feet from its mouth, running in a northeasterly direction, is a cut-off which extends upwards through all the levels, and which contains no ore as far as it has been prospected. Ore can be seen in this level along the ledge in many places, in pockets, which sometimes yield rich ore and sometimes low grade, but which will average over $100 to the ton. All the ores from the levels above are lowered to this level by means of chutes, and then hauled out by cars to the smallest of the large chutes. At the month of this level is the company's blacksmith shop, which is kept constantly busy making and repairing implements used in the mine. The lowest level runs in a northerly direction, and is 375 feet from the apex of the mine, and is 550 feet long. At a distance of 400 feet from the month of the tunnel is an upraise of 170 feet. In this level several veins of ore have been cut through. But it is the intention of the managers to cut through the ledge before any quantity of ore will be taken from this level. After awhile connection will be made from this level to those above, and all the ore that now passes out of the fourth level into the two large chutes will be discharged from the fourth level into the new 60-ton bin a short distance above the superintendent's office.

There are on the dump about 2,000 tons of third grade ore, which averages about $25 to the ton, which it will not pay at present to mill, but will probably be reduced when a quartz mill is put up near the mine, which will, no doubt, be done at some time, not far in the future. Good roads have been graded to the mine, and every improvement is being made that will lessen the expense of operating the same, and no doubt some day a tunnel will be run from Wall street canyon, under the town of Calico, into the mine, out of which the ore will be taken in ore cars.

MECHANICAL PROGRESS.

Solid and Hollow Iron Columns.

A confusion of ideas is sometimes found among practical men respecting the comparative strength of solid and hollow pillars. One hears it often said, says the *Building News*, that a hollow pillar is stronger than a solid one. Now, this is, as one able authority has pointed out, not absolutely the case: it is perfectly true that, comparing the strength of two pillars of the same hight and diameter, one solid and the other hollow, the latter has the advantage of being economically stronger. The fact is, the solid column is stronger than the hollow of the same external diameter: but the lesser area is more effective than the greater, because the central portions of the solid pillar are less useful in resisting the bending force than the metal in the circumference of the hollow pillar. But if the quantity of material in both the solid and hollow pillar of equal hight is the same, the hollow pillar is by far the stronger. A simple geometrical construction will enable any one to understand the fact, by enabling us to proportion a hollow column of the area as that of a solid one, by one of the diameters being given.

It is shown, in fact, that hollow columns of the same area of metal as the solid one may be made to any larger diameter, their strength increasing proportionately till a limit is reached by the shell of the metal becoming too thin to insure a sound casting. Taking an example from Downing's work a hollow pillar nine inches in external diameter, having an internal diameter of 8.062 inches, and a thickness of metal of 0.47 inch, or about one-half inch, is five and one-half times stronger than a solid pillar with the same quantity of metal. A thickness of one-half inch may be regarded as a practical limit in manufacture.

VISIBILITY OF RULED LINES.—In regard to the "visibility of ruled lines on glass," to which reference was made in these columns two or three weeks since, a correspondent of the *Scientific American* says: I find that lines properly ruled on glass are similar to graven lines: they are smooth, clean cut, having a definite shape and depth. Such lines are always visible in the microscope, and central or oblique light will show the bottom of each cut as a dark or colored line, plainly visible, and requiring no graphite or other foreign substance to indicate it. The microscope is the test for a properly ruled line. The mechanical elements (pressure, etc.) entering into the process of ruling are not at all evidences that lines have been properly ruled. The slightest accident to the point of the cutter, or the surface of the glass not being perfectly clean, will spoil a line; that is, produce a scratch which cannot be satisfactorily illuminated in any light. Well ruled bands of lines, 70,000 to 80,000 to the inch, are visible in the microscope with central light; and with a Smith vertical illuminator (giving central light), I have seen 100,000 lines to the inch. As these individual lines have a width of about 1-200,000 of an inch only, it follows that the difficulty is not to see such a narrow line, but to eliminate the diffractions which tend to blur the image in the microscope, and so prevent the resolution or separation of the lines in a band of them.

THE TREATMENT OF CEMENT.—At an assembly of German manufacturers an interesting report was made by Von Froideville, in which he asserts that a really good cement, one that has been suitably mixed, not only does not crack, but even in a northern climate is able to resist the weather. If, however, too much water has been used, so that a mossy crust forms on the surface, and the whole mass is not homogeneous, the cement checks or cracks, and as soon as hair cracks appear moisture enters and the frost destroys it. Another fault referred to in this report is that of the cement striking out, which it ought not to do. Von Froideville also says that cement can be colored nicely and permanently with suitable colors, but quite a good deal of color is necessary if it is required to entirely hide the natural color of the cement and give it the exact color desired. It is to be borne in mind, however, that the addition of any coloring substance to cement tends to give it a softer and more friable character, so that there is required a comparatively larger quantity of cement than without color.

THE ORIGIN OF WATERSPOUTS.—What facts were noted of several waterspouts seen in the Pacific ocean have been examined by Mr. George Atwood, and he concludes as follows: The waterspouts on the Pacific were caused by a cloud heavily charged with cool moisture drifting from the high mountains of Costa Rica coming into contact with air currents and clouds traveling in a different direction and of a warmer temperature, by which contact the clouds surcharged with aqueous vapor acquired a rotary motion, causing them to discharge a part of their moisture and make them assume a cylindrical form, which finally fell by its own gravity into the ocean.

THE production of rails of various descriptions in the United States last year was as follows: Bessemer steel, 1,438,155 tons: iron, 227,874 tons; open hearth steel, 22,765 tons; total, 1,688,794 tons. The corresponding production in 1882 was as follows: Bessemer steel, 1,330,302 tons; iron, 488,581 tons; open hearth steel, 25 217 tons: total, 1,844,100.

THE band-saw mill, says the *Wood Worker*, is evidently the mill of the future where valuable hard-woods are to be cut. Even now the novelty of this style of mill has almost worn off, and they are being set up in nearly every part of the country. That this mill is looked on as the coming mill is evidenced by the fact that there are not less than half a dozen prominent machinery builders who have recently brought them out, or are preparing to.

The product of a band-saw mill sells for a better price than the product of a circular saw; but it is not every person who can run a band saw for cutting logs. The man who successfully engineers a band mill is always capable of doing first-class work, and with the advantages his machine possesses over the circular mill for nice work, there is little wonder that his product sells for more. There is likely to be a loud call for competent band-saw millers within the next few years.

STOPPING ENGINES BY ELECTRICITY.—The Dundee *Advertiser*, in describing this new application of electricity, says: "The huge engine at Manhattan Works, working at from 600 to 700 horse power, and driving a fly-wheel of about 35 tons weight, formerly took two minutes to come to rest after the steam had been taken off. This apparatus has been fitted to it, and the ponderous engine is now brought up in 30 seconds. To see this powerful, majestic piece of machinery, the developer of power for a long range of works, almost immediately brought to a standstill by the mere touching of a button at the far end of the building, is an impressive illustration of the easy control of enormous force by wisely ordered arrangements. To mill-owners the utility of the apparatus will be evident." The device has been applied to the driving engines of several of the largest mills in Dundee.

THE BEST MATERIAL FOR JOISTS.—It is claimed by many builders that wood joists, encased in plaster, are proof against any ordinary fire, and for many reasons are much preferred by them to the ordinary regulation fire proof iron joists. Strips are attached to the joists, over these strips of iron are run, and on these the plaster is spread. The theory is that in any ordinary fire these joists thus treated will be fire proof, and only when the fire has reached such a fury that the building must go any way will they be affected. Here comes in one of the advantages claimed for them. When a building is being burned by a furious fire the iron joists expand and crush out the walls, and do other damage. The wood joists would simply be burned up without injuring the walls at all.—*Lumberman*.

ALUMINUM COATED IRON.—Dr. Gehring, of Landshut, has invented a very simple process of coating iron with aluminum, by which it may be cheaply rendered highly ornamental. He uses a Bunsen burner with a blast or a muffle, and is thus able to manufacture various objects of the durable metal for daily use, the coating of aluminum giving them a silver white luster. He also produces a gold luster or any other color, and even an enamel coating, all of which substances are said to adhere very firmly to aluminum. Aluminum, like tin, does not oxidize under normal conditions, and even stands the heat of an ordinary fire, while it is much more lustrous than tin.

A NEW WOOD SCREW was recently described by Mr. Geo. Barnham, Jr., at a meeting of the Philadelphia Engineering Club, in which the thread, instead of being cut, is formed by pressure, the blank being passed through a series of rolling dies. The first set of dies forms a slight ridge, the second deepens the depression, and so on until the screw is perfectly formed. The point of the screw is left conical, without any thread, thus differing from the ordinary wooden screw, so that, in soft woods, it may be driven part way home before using the screw-driver, as is now done with most iron screws. Screws of all the larger sizes and bolts are made in this way. The thread is said to be as perfect to the eye as a cut wood-screw, and much stronger.

WASTING OIL.—One difficulty with tyros in the use of machinery is the wasting of oil by its to profuse use. It often happens that a bearing will heat when supplied with too much oil that will run cool when supplied with the proper quantity. The reason is that when the lubricator is partly worn it becomes sticky: it resists removal; it remains tenaciously between the shaft and its bearings; whereas too much of it, usually thin and limpid, serves to "wash the bearing," and let the part into closer contact.

PULLEYS.—*The Wood Worker* says: Our cast iron pulleys are much lighter than formerly, and latterly, wrought iron pulleys have been introduced, having in addition to the advantages of being already balanced and being stronger than cast pulleys, that of being very much lighter. Wooden pulleys of very neat construction have been placed on the market, and paper has also been pressed into service as pulleys.

MARBLE VENEERS.—Another substitute for wood finishing in the line of veneers has made its appearance. A patent marble veneer company has been formed in New York City for the manufacture of pliable veneers, that perfectly imitate marble or any variety of wood, and can be applied to any surface, no matter how irregular. The advantages are apparent. It is predicted that it has a profitable and possibly brilliant future.

SCIENTIFIC PROGRESS.

Progress of Electric Science.

Speaking of the work of the electricity division, and the recent marvelous development of electrical inventions, Mr. E. M. Bentley, one of the examiners of the electrical division of the Patent Office, gives some very suggestive facts. He says that about two thousand applications for patents in electricity were filed in 1882, of which about two-thirds were granted. To show how the subject has grown in importance within a few years, he said that in 1877 electricity was a sub-class in a division. Now it is the largest division in the Office, and regarded as the most important. The astonishing growth is due chiefly to two causes: First, the invention of the telephone; and, second, the development of the magneto-electrical machine. The telephone had opened, directly or indirectly, a wide field of inventions. The minds of many persons throughout this country were turned to this class of invention, and not only were improvements upon the telephone itself attempted, but attention was given to a great many incidental appliances useful in its successful application.

The second great stimulus to invention was the development of the magneto-electrical machine. For thirty years the world has been awaiting a cheap and convenient source of electricity. Immediately following the discoveries of Faraday and others, from 1830 to 1840, there was a wide spread effort to make practical use of them, and special activity was manifested in the lines of electric lighting. The arc light was put into practical form, and the foundations of incandescent lighting were laid. But no economic source of electricity was at hand; for the galvanic battery consumed too much zinc for profit. The principle of the magneto-electric machine had, indeed, been long known: but it was left for the Italian, Pacinotti, in 1860, to perfect a machine wherein continuous and constant currents were generated. The idea literally lay on the shelf, however, until 1870, when Gramme re-invented practically the same machine, and pushed it into notice. He was speedily followed by the Siemens brothers, of Berlin, and by Mr Brush and others in the United States. The magneto-electric machine, affording a cheap and abundant supply of electricity, immediately rendered practical all the half completed inventions of thirty years, and opened the way to many new ones. Brush got his patent in 1877, Weston soon after, and the growth of the electricity division of the Patent Office has been steady and marvelous ever since. The invention had been, however, rather in the application of known principles than in the discovery of new ones; for during the fifty years that have elapsed since the investigations of Faraday, little new has been added to the science of electricity. The present activity springs from the application of well known exhibitions of the still unknown force; and moreover, only a few of these features of the science have been as yet made of practical value. One of the broadest and most successful patents appears to be the telephone.

Absorption of Oxygen by Iron Cement.

In the construction of a railway bridge over the Forth, a number of cylinders were sunk into the bed of the river. They were built of iron rings six feet in diameter and several feet high, and made a total hight of sixty feet. The space round the sections was filled up from the inside by a rusting composition of iron turnings mixed with sulphur and sal ammoniac. When wet, this mixture oxidizes and swells up, so as to fill the spaces into which it is thrust. It was applied to the joints by one man. One day last May, however, when there was a perfectly still, somewhat hazy atmosphere, and considerable heat without direct sunshine, this man was observed to become overpowered by some "mysterious influence," and a companion descended by a windlass to bring him up to the top of the cylinder. He managed to get the man into the bucket of the windlass, and so to get him hauled up into purer air; but the deliverer himself succumbed to the same influence, and falling into a pool of water at the bottom of the cylinder was unfortunately drowned. One of the contractors now descended, taking care, however, to fasten a rope to his body, and it was fortunate he did so, as he also succumbed and had to be pulled out by the rope. Dr. Wallace was called in to account for this fatal accident and traced it to the absorption of oxygen by the rusting compound, thus depriving the air in the cylinder of its sustaining power. The oxygen combined with the iron and sulphur of the mixture, and the state of the atmosphere prevented free circulation of fresh air into the cylinder. The result was that the gas breathed by the man was nitrogen, or air robbed of its oxygen. The normal proportion of that gas in the air is 20.9 or 21 per cent, and Dr. Augus Smith has shown that this proportion cannot be altered, even by one quarter per cent, without producing appreciable effects, while a loss of one half per cent gives rise to serious inconvenience, and air containing only twenty per cent of oxygen may produce grave consequences if breathed for a considerable time. When the deficiency of oxygen exceeds this to a sensible extent, a candle refuses to burn.

THE RADIATION OF SILVER IN SOLIDIFYING.—At the International Congress of Electricians in 1881, M. J. Violle proposed, and M. Dumas, the famous chemist seconded, the use of an absolute unit of light consisting of the radiation emitted by a square centimetre of platinum in melting. At the instance of M. Cochery, the French Minister of posts and telegraphs, an investigation of the subject has been begun by M. Violle, and his first experiments have led him to some observations on the raidation of silver in solidifying. A bath of pure melted silver was placed under a thermo-eletric pile connected with a mirror galvanometer. The radiation from the bath fell normally on the battery through an aperture in a double-walled screen kept cool by circulating water. As the bath cooled the pile showed that the radiation slowly decreased until the instant just before solidifying, when there was a light increase preceding the final decrease after solidification.

TO DETERMINE THE HEATING POWER OF COAL.—In determining the heating power of coal and other combustibles, an apparatus is now employed, consisting of a cylindrical vessel of copper, punctured below with numerous small holes, and to the top of which is attached a hollow tube of the same material, closed with a stop cock; a small vessel of the same form to contain the materials, and a basal piece in which to fit it. In practice, a weighed portion of the finely powdered combustible, is intimately mixed in the mortar with a certain quantity of nitrate and chlorate of potassa, and this mixture is next placed in the small copper cylinder, and ignited with a fuse of known dimensions. Before the combustion takes place, the outer cylinder is slid down over it, being held there by springs attached to the basal piece, the whole contrivance being then plunged into a vessel containing a quantity of water of known temperature. The combustion soon sets in, continuing with vigor until the material has burned completely out. The instant the combustion has ceased, the stop cock in the tube is turned, and the water allowed to enter the air chamber, to cool down the heated interior; the temperature of the water is now observed. From these data it is easy to calculate the results, making allowance for the slight loss occasioned by the impossibility of bringing the apparatus back to its first temperature—owing to the increased temperature of the water—and the very small losses by radiation and conduction.

BY THE following simple method, plates for telephones and microphones may be made of any thickness: One or more plates of the desired shape and size are cut out of a piece of sheet iron. After dressing, rub them well on both sides with a dry cloth. This is essential to obtain an equal thickness, as otherwise the greasy spots left by handling would prevent a uniform action of the acid. It is better, also, to treat only one plate at a time. After wiping the plate well, it is plunged vertically, so as to be submerged in a bath of azotic acid. Acid that has been used several times in a Bunsen battery can be used, or else the azotic acid of commerce, with the addition of one fourth of water. The plate must be taken out frequently to ascertain the thickness. When the proper thickness is obtained, the plate is well washed in water, until the coating of blackish rust or oxide has completely disappeared; it is then let dry and one or more coatings of black Japanese varnish given on both sides to prevent oxidation. In this way plates may be obtained as thin as desired, and of all shapes and sizes. When membranes are used in microphones this is no slight advantage. *La Nature*.

SINGULAR EXPLOSIONS.—A singular accident and one of a somewhat alarming character recently occurred at one of the ironworks establishments in Middlesboro, England. A large slag ball was taken from one of the furnaces and tipped over upon the slag heap when it instantly exploded. Three large pieces of the half molten slag were thrown high into the air, and, in falling, crushed through the roof of the railway station near by, falling in the immediate vicinity of several passengers waiting for the train. The query naturally arose—how was the explosion produced? Another equally singular explosion is reported as having recently occurred at Lancaster, Texas, where a bin containing about 3,000 bushels of cotton seed recently exploded, as supposed, from the generation of gases.

TO REMOVE THE ODOR FROM PETROLEUM.—The disagreeable odor from petroleum or benzine may be removed, according to F. Grazer, by allowing it to percolate through animal or wood charcoal, or by treating it with sodium carbonate or lead carbonate. Another plan, which is recommended, is to employ a solution of bichromate of potassa, acidified with sulphuric acid, with which the benzine is agitated. A subsequent washing with water is necessary. A simpler plan than any of the above, that we recall having seen recommended, is to agitate the benzine with milk of lime, freshly prepared, which is reported to be very effectual.

ORIGIN OF THE UNIVERSE.—The well known Parisian editor, M. Moigno, has written a paper on the synthesis of the heavens and the earth. In this he makes the deduction that everything originated from ether, which first generated hydrogen. To an impulsation of ether he attributes the existence throughout the universe of the action of gravitation.

MINING SHAREHOLDERS' DIRECTORY.

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ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'NT	SALE.	SECRETARY.	PLACE OF BUSINESS.
Alta S M Co.	Nevada.	26.	25.	July 3.	Aug 7.	Aug 27.	Wm. H. Watson	302 Montgomery st
Andes S M Co.	Nevada.	22.	25.	June 27.	Aug 2.	Aug 22.	B Burris	309 Montgomery st
Argenta M Co.	Nevada.	16.	25.	June 21.	July 24.	Aug 17.	E M Hall	327 Pine st
Belle Isle	California.	5.	20.	May 16.	June 19.	July 10.	J W Pew	310 Pine st
Benton Con M Co.	Nevada.	10.	10.	May 26.	July 2.	July 19.	W H Watson	309 Montgomery st
California M Co.	Nevada.	8.	20.	June 26.	Aug 4.	Sept 3.	C P Gordon	309 Montgomery st
Con Amador	California.	5.	50.	May 17.	June 21.	July 11.	F B Latham	408 California st
Caledonia M Co.	Nevada.	39.	20.	June 15.	July 19.	Aug 9.	R Wegener	414 California st
Excelsior D G M Co.	California.	1.	5.00.	June 5.	July 9.	July 26.	W. Cunningham	326 Montgomery st
Exchequer M Co.	Nevada.	19.	20.	June 14.	July 19.	Aug 9.	C E Elliott	327 Pine st
Eureka Con M Co.	Nevada.	4.	1.00.	May 21	June 21.	July 16.	P Jacobus	309 Montgomery st
Grand Prize M Co.	Nevada.	14.	25.	June 25.	July 27.	Aug 20.	E M Hall	327 Pine st
Gould & Curry M Co.	Nevada.	45.	50.	June 15.	July 20.	Aug 13.	A K Durbrow	309 Montgomery st
Hale & Norcross M Co.	Nevada.	77.	50.	June 7.	July 11.	Aug 2.	S F Lightner	309 Montgomery st
Independence M Co.	Nevada.	11.	30.	May 25.	June 28.	July 23.	J W Pew	310 Pine st
Martin White M Co.	Nevada.	15.	25.	July 9.	July 11.	Aug 8.	J Scoville	309 Montgomery st
Mt Auburn M Co.	California.	11.	20.	May 25.	June 27.	July 16.	J H Wilkins	438 California st
North Belle Isle	California.	6.	20.	May 16.	June 2.	July 12.	J W Pew	310 Pine st
Potosi	Nevada.	12.	25.	May 17.	June 20.	July 11.	W E Dean	309 Montgomery st
Red Hill H M Co.	California.	8.	05.	May 24.	June 26.	July 23.	E Hestres	328 Montgomery st
Tip Top M Co.	Arizona.	6.	25.	May 29.	July 6.	Aug 6.	H Deas	309 Montgomery st
Utah S M Co.	Nevada.	44.	1.00.	May 16.	June 20.	July 9.	G C Pratt	309 Montgomery st
Wales Con G & S M Co.	Nevada.	1.	25.	May 14.	June 15.	July 16.	J H Applegate	320 Sansome st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS

Alexander M Co.	Nevada.	2.	1.00.	June 20.	Aug 6.	Aug 27.	J K Warren	307 Montgomery st
Alaska M Co.	California.	2.	4.00.	June 7.	July 9.	July 28.	A Judson	320 Sansome st
Bald Mountain M Co.	California.	2.	3.	June 26.	July 27.	Aug 30.	L Shannahan	125 First st
Continental C & I Co.	California.	1.	05.	May 26.	July 5.	July 24.	W E Greene	309 Montgomery st
Champion M Co.	California.	12.	10.	June 4.	July 7.	July 25.	F Wetzel	522 Montgomery st
Eintracht G M Co.	California.	2.	05.	June 12.	July 7.	Aug 3.	H Kunz	209 Sansome st
Genesee M Co.	California.	1.	40.	June 20.	July 30.	Aug 22.	J Stedtfeld	419 California st
Goodshaw M Co.	California.	14.	10.	June 6.	July 14.	Aug 4.	C C Harvey	309 Montgomery st
Gorilla M Co.	California.	1.	10.	June 1.	July 7.	Aug 1.	A A Engnist	436 Montgomery st
Hamburg M Co.	Nevada.	8.	25.	May 24.	July 2.	July 24.	D A Jennings	401 California st
Homeward-bound M Co.	California.	5.	05.	May 28.	July 10.	July 28.	A Bowie	314 Montgomery st
Lima Con M Co.	Arizona.	6.	05.	June 11.	July 18.	Aug 6.	R D Hopkins	436 Montgomery st
Morgan M Co.	California.	9.	50.	May 28.	June 29.	July 20.	C L Tilden	806 Market st
Pacific M & Reducing Co.	California.	1.	25.	June 20.	July 25.	Aug 15.	J W Bevling	415 California st
Roma Union M Co.	Nevada.	2.	02.	June 18.	Aug 6.	Aug 27.	F X. Sinon	518 Sansome st
San Miguel Con M Co.	Mexico.	2.	1.00.	Apr 28.	June 4.	July 22.	C G Brooks	210 Front st
Yaqui M Co.	Mexico.	1.	30.	May 24.	June 28.	July 18.	T T Atkinson	337 Pine st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Belmont M Co.	Nevada.	J W Pew	310 Pine st	Annual	July 13
Best and Belcher	Nevada.	W Willis	309 Montgomery st	Annual	July 9
New Coso M Co.	California.	R N Shainwald	320 Sansome st	Annual	July 10
Savage M Co.	Nevada.	E B Holmes	309 Montgomery st	Annual	July 9
Utah S M Co.	Nevada.	G C Pratt	309 Montgomery st	Annual	July 10
Union Con S M Co.	Nevada.	J M Buffington	309 Montgomery st	Annual	July 16

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Bulwer Con M Co.	California.	W Willis	309 Montgomery st	05	Apr 12
Contention Con M Co.	Arizona.	D C Bates	309 Montgomery st	25	Apr 28
Kentuck M Co.	Nevada.	J W Pew	310 Pine st	10	June 20
Navajo M Co.	Nevada.	J W Pew	310 Pine st	25	May 14
Northern Belle M & M Co.	Nevada.	Wm Willis	309 Montgomery st	50	Apr 16
Silver King M Co.	Arizona.	J Nash	315 California st	25	June 15
Standard Con M Co.	California.	Wm Willis	309 Montgomery st	25	June 12

Table of Highest and Lowest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING June 13.		WEEK ENDING June 20.		WEEK ENDING June 27.		WEEK ENDING July 5.	
Alpha	2.50	3.25	2.00	2.75	1.75	2.00	...	1.80
Alta	.75	.85	.60	.70	.45	.60	.40	.45
Andes	.75	.85	.60	.75	.55	.60	.45	.50
Albion	.35	.55	...	.35	.35	...	...	...
Argenta	.20	.45	.20	.30	.15	.20	.10	.15
Atlas	...	...	...	...	...	...	...	...
Belcher	1.55	2.25	1.35	1.75	1.10	1.20	...	1.15
Belding	...	...	...	...	...	...	...	...
Best & Belcher	5.00	6.00	4.30	5.25	4.05	4.50	4.05	4.20
Bullion	1.10	1.50	1.05	1.25	.90	.95	...	.75
Beehtel	...	...	...	...	...	...	...	...
Belle Isle	...	.20	.40	.50	.45	.60	...	.50
Bodie Con	1.00	1.10	1.00	1.05	.90	1.05	.80	.90
Benton	...	.15	.5	.10	.05	.15	...	...
Bodie Tunnel	...	...	...	...	...	...	...	...
Caledonia	...	.20	...	.10	...	...	...	...
California	...	.35	.45	.25	.40	.10	.25	...
Challenge	...	.45	.55	.40	.50	.40	...	.30
Chollar	3.40	3.80	3.20	3.45	2.75	2.90	3.00	3.85
Confidence	3.10	3.55	2.50	3.20	2.00	2.40	2.10	2.25
Con. Imperial	...	...	...	.10	.05	.20	...	.10
Con. Virginia	.70	.80	.55	.70	.45	.55	...	.45
Crown Point	1.60	2.35	1.40	1.65	1.25	1.45	1.25	1.30
Day	...	.40	.55	1.00	.60	.85	.50	.55
Elko Con	.15	.20	.15	.30	.20	.25	...	.25
Eureka Con	3.00	3.50	3.10	3.25	5.00	8.00	4.10	5.00
Eureka Tunnel	.70	.85	...	.75	.25	.70	...	.60
Exchequer	.45	.65	.30	.75	.20	.30	...	.25
Grand Prize	.15	.45	.20	.30	.05	.25	.05	.10
Gould & Curry	2.50	3.95	2.70	3.40	2.50	2.80	2.25	2.45
Hale & Norcross	7.75	8.50	6.50	7.75	5.25	7.00	6.00	7.00
Holmes	...	.90	...	...	...	...	...	...
Independence	...	.35	.30	.35	.35	1.05	...	...
Julia	...	.15	.10	.15	.00	.15	...	...
Justice	.25	.30	...	.30	.15	.20	...	...
Jackson	...	...	...	...	...	...	...	...
Kentuck	...	2.75	...	...	...	2.50	...	...
Martin White	.5	.20	...	...	.05	...	...	...
Mono	...	.10	...	...	...	...	...	...
Mexican	4.30	5.00	3.10	4.15	2.80	3.05	2.90	3.00
Mt. Diablo	...	...	3.00	3.25	3.00	3.25	...	...
Mt. Potosi	...	...	...	...	...	...	...	...
Noonday	...	...	...	...	...	...	...	...
Northern Belle	6.25	7.00	6.50	65	6.50	65	62	6.75
North Nooday	...	...	...	...	...	...	...	...
Navajo	1.50	1.65	1.85	2.35	2.25	4.20	2.90	3.20
North Belle Isle	...	.20	...	...	.35	.50	...	...
Occidental	...	2.10	...	2.00	.65	1.90	...	1.25
Ophir	3.30	3.95	2.70	3.40	2.25	2.90	2.25	2.55
Overman	.50	.65	.40	.60	.35	.40	...	.30
Oro	...	...	...	...	...	...	...	...
Potosi	1.40	1.60	1.30	1.60	1.25	1.40	1.25	1.40
Pinal Con	.80	1.00	...	.90	...	.80	...	...
Savage	2.60	2.80	2.40	2.70	1.90	2.30	1.95	2.10
Seg. Belcher	...	3.00	...	...	...	...	...	...
Sierra Nevada	7.00	8.25	4.45	6½	3.60	4.50	3.55	3.80
Silver Hill	...	.10	...	.10	...	.05	...	...
Silver King	10¢	10¢	...	10¢	10	10¢	...	.10
Scorpion	.85	1.00	.70	.85	.60	.70	...	...
Tuscarora	...	...	...	...	...	...	...	...
Union Con	8½	9¢	4.80	7¢	4.35	5¢	4.40	4.80
Utah	2.80	3.75	2.70	3.75	2.80	4.90	2.75	2.80
Ward	...	...	...	...	...	...	...	...
Wales	...	...	.25	.30	...	...	...	...
Yellow Jacket	5.00	5¢	4.25	4.75	3.60	4.15	3.65	3.90

Bullion Shipments.

Hanauer, June 25th, $3,500; Ontario, 25th, $1,526; Horn Silver, 25th, $9,000; Hanauer, 28th, $3,850; Horn Silver, 27th, $18,000; Ontario, 28th, $4,447; Horn Silver, 28th, $9,000; Hanauer, 30th, $2,020; Crescent, 30th, $3,775; Ontario, 30th, $8,233; Horn Silver, 30th, $9,500.

A LIVELY CAMP.—The Leadville mines employ 3,250 men, and the pay rolls aggregate $280,000 per month. Leadville has produced $7,557,000 in gold, and $70,000,000 in gold, silver and lead up to the present time, while the incorporated mining companies of that city have paid stockholders in dividends within the past four years nearly $20,000,000.

NEGOTIATIONS between France and China have been difficult and unfavorable but have not been broken off.

Sales at San Francisco Stock Exchange

THURSDAY A. M., July 5.

200	Andes	50	@ 40
450	Alta	50	@ 40
200	Argenta	10	@ 40
800	Belle Isle	45	@ 40
270	Bullion	40	@ 1
320	B. & Belcher	4.55	@ 4.60
100	Bodie Con	85	@ 90
680	Con. Virginia	45	@ 50
1230	Chollar	40	@ 95
200	Crown Point	1.40	@ 1.45
425	California	10	@ 15
70	Confidence	2.40	@ 2.50
550	Day	50	@ 55
50	Eureka Con	51	@ 52½
300	Eureka Tunnel	65	@ 70
100	Exchequer	25	@ 30
120	Gould & Curry	2.55	@ 2.60
100	Grand Prize	05	@ 10
1010	Hale & Nor	63	@ 65
1070	Mexican	3.30	@ 3.40
150	Navajo	2.00	@ 2.05
40	Northern Belle	65	@ 70
475	Overman	40	@ 50
825	Potosi	1.45	@ 1.50
160	Savage	2.05	@ 2.10
100	Pinal Con	70	@ 75
1495	Sierra Nevada	4.70	@ 4.95
200	Scopion	60	@ 65
900	Savage	2.00	@ 2.15
90	Silver King	10	@ 20
500	Senator	10	@ 15
100	Tiptop	45	@ 50
150	Utah	2.80	@ 2.90
2440	Union	5½	@ 6
80	Yellow Jacket	3.90	@ 4.00

AFTERNOON SESSION.

500	Alta	40	@ 45
1485	Chollar	3.40	@ 3.45
200	California	10	@ 15
250	Con. Virginia	45	@ 50
40	Confidence	2.40	@ 2.50
75	Crown Point	1.40	@ 1.45
1500	Con. Imperial	1.05	@ 1.10
50	Day	55	@ 60
150	Eureka Con	54	@ 55
100	Exchequer	20	@ 25
500	El Dorado	25	@ 30
10	Gould & Curry	2.60	@ 2.65
1080	Hale & Nor	63	@ 65
560	Mexican	3.05	@ 3.10
815	Navajo	2.15	@ 2.60
40	Northern Belle	65	@ 70
500	N. Belle Is	20	@ 25
100	Overman	35	@ 40
420	Potosi	1.40	@ 1.45
125	Silver King	10	@ 15
280	Savage	2.00	@ 2.05
1065	Sierra Nevada	3.60	@ 3.65
100	Scorpion	4.80	@ 4.90
2140	Union Con	4.35	@ 4.45
50	Yellow Jacket	3.90	@ 4.00

Mining Share Market.

Mining stocks have been dull. The abandonment of business at the Board, for the few holidays, has of course had the usual effect. The *Enterprise* says that prices have generally gone down by slow stages, as the faith of holders and north-end stocks has oozed out during the progress of the west crosscut on the 3000 level toward the point where it was expected would be cut the ore vein found on the 2900 level. Many have arrived at the conclusion that the streaks of quartz already cut where the continuation of the vein found above, or that said vein does not come down to the 3000 level. Others, however, in view of the fact that no clay wall has yet been cut or water tapped, have faith that the vein looked for is still ahead. The foundation for this faith is the fact that the west wall of the ore vein when last seen on the 2900 level was slightly inclined to the west. Supposing, however, that its general course should be vertical, there is still room for a considerable body of ore against it. The east wall must have changed its dip, and assumed a more vertical position than it had above in the Union gound, or something would have been seen of it. We know that the dip of said wall was much steeper in the Sierra Nevada than in the Union ground, and as the whole chimney or deposit was making toward the south this dip would be likely to be carried to about where the crosscut is being run on the 3000 level. Broken in two by the occurrence of our national holiday, neither fraction of the current week, showed much vivacity in mining shares. On the opening of the Board, Thursday morning after a recess of four days, the report that the Union Con. crosscut had developed some good ore obtaining, that stock was advanced $100 per share over Saturday's prices; whereby, the bulls were a good deal elated. That such a trifling advance should have created such a stir shows the low estate to which this business has fallen; nor would there be much to regret did this incident presage its early extinction. With this shrinkage of business the attendance at the Board has been light. The din and clamor of the olden time has nearly subsided, while the army of stock dabblers that once swarmed about the Exchanges, or loitered in Pauper alley, has dwindled to a mere Corporal's guard. The manipulator of deals will be obliged to open up somewhere, another bonanza, or he will in a short time find his occupation clean gone. Mere prospects and favorable reports will fail to keep life in the market much longer.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

JACKSON.—*Ledger*, June 30:—The prospects of this property developing into a profitable mine have materially improved of late. In upraising a body of ore from three to five feet in width has been encountered, which prospects big, much of the rock showing free gold. From 40 to 50 tons of milling ore lies on the dump. Two gentlemen from San Francisco prominently identified with the enterprise came up Wednesday night on business.

PACIFIC.—In reply to an inquiry by the editor of the New York *Mining Record*, we will say that the Pacific Company has absorbed the Empire, according to good authority, in this way: In a suit for damages brought by the Pacific against the Empire some three years ago, the plaintiff recovered judgment for $75,000. The general opinion is that in satisfaction of this judgment the managers of the Empire have voluntarily surrendered the property to the Pacific, although we are not aware that any formal transfer has been made.

MAMMOTH.—The air-compressor for the tunneling operations on this claim arrived in Jackson Thursday evening, and proceeded to the mine early this (Friday) morning. It is from the Marysville foundry, and made to operate two drills. The drills have not arrived. It will take two or three weeks to get all the machinery in position ready for actual tunneling.

IMPORTANT CONSOLIDATION.—A document embracing some 40 pages of printed matter has been filed with the County Clerk for recording. It consists of articles of agreement and consolidation of the Pacific, Empire and Plymouth mines, of Plymouth, under the name of the Plymouth Consolidated Gold Mining Company. The capital stock is $5,000,000, divided into 100,000 shares of $50 each. The Plymouth mine, adjoins the Pacific on the east. This consolidation is probably the final outcome of the long standing litigation between the Empire and Pacific mines.

MISCELLANEOUS.—The Seaton Company are vigorously prospecting the Maryland claim, adjoining the Seaton, and which was recently purchased by the Seaton Company.

Butte.

GOLD DUST.—*Record*, June 30: To-day a Butte creek miner came to town, and deposited something over two thousand dollars' worth of gold dust in the bank of Butte county. This deposit was the result of a month's clean-up. The miner reported everything quiet along the creek, only a few of the claims being worked. "The miner" wisely objects to having his name mentioned in this paper, fearing that foot-pads may lay for him sometime.

El Dorado.

THE MELTON MINE.—*Mountain Democrat*, June 30: H. H. McClelland, Superintendent of the Melton mine, Grizzly Flat District, was in town Tuesday and Wednesday. The improvements in his mill have been completed, and he started up his fifteen stamps last Monday. He is working four levels, each, except the lower one of course, 100 feet above another; putting through the mill all that comes out and realizing a satisfactory and very respectable average.

GREENWOOD.—Georgetown *Gazette*, June 30: Mr. A. J. Morrell, President of the Morrell Con. Gold M. Co., has been in Greenwood during the past week busily engaged in arranging details for exploring the Co.'s mines on the Cedarberg belt. The 6-stamp mill, which is a circular battery for prospecting purposes, weighing all 30 cwt., is now on the ground and will shortly be put in place, and will then be used for reducing the vein matter extracted, many portions of which show free gold. Mr. Morrell proposes to apply a small donkey engine for running the mill. Mr. Easton the superintendent arrived with Mr. Morrell, and with Mrs. Easton and their little daughter are a very agreeable addition to our population, and will we hope make a long and prosperous stay in Greenwood. Judge Swift was also of the party, a gentleman whose legal experience and acumen is only equaled by his practical knowledge of mines and mining. Commencing with California in '49 the Judge has since then owned, worked and experted mines in Australia, Colorado, Arizona, Mexico, South America and other places that he has visited, not simply as a tourist, but as a practical miner, reducing theory to practice. We hope to see Judge Swift again in this section, and that he will then be able to more thoroughly examine our mining opportunities. The new Eureka ledge continues to improve in development. Mr. Cheek has uncovered the ledge about 100 ft south of the first prospect shaft and finds the lode in no way inferior, it being more than 10 ft in width and pr specting from wall to wall in a good showing of free gold. Mr. Check is now sinking for this lode some 200 ft to the north, and by another week we hope to report the discovery of the lode at this point. The carpenters are pushing ahead vigorously on the new mill building. The mill and machinery are now at Auburn station, and will be here in a few days.

Mariposa.

A GOOD MINE.—*Herald, June 29*: We are glad to know that the mine owned by Louis Repetto and Alex. Bogliolo, on a branch of Maxwell's creek about five miles from Coulterville, furnishes promising prospects. The lode is about three or four feet in width, and produces some fine gold-bearing quartz. A section of four or five inches on the vein is very rich in free gold. Some specimens we have seen were simply superb. The quartz is very brittle and therefore of easy milling grade.

Mono.

STANDARD CON.—Bodie *Free Press* June 28: There were extracted and shipped to the mills during the past week 1475 tons of ore. The bullion shipment was valued at $32,334.47. The west crosscut 1200 level, has been advanced during the week 19 ft; total length, 320 ft. South drift No. 2 has been advanced 19 ft; and it is now 13 ft. The vein at this point is about 5 ft wide.

BODIE CON.—During the past week there were 131,885 tons of ore hauled to the mill, and 174,240 were crushed. The average value of the pulp was $28.92 per ton; that of the tailings $6.02. There were 218 car-loads of ore hoisted from the mine. At the 1000 level the west crosscut was driven 11 ft; total length 275 ft.

BULWER CON.—The west crosscut from the north drift 700 level, has been advanced during the week 15 ft; total length, 304 ft. The ground continues hard.

Plumas.

CRESCENT MINE.—Greenville *Bulletin*, June 27: At the Crescent mine all work, other than pumping, is for the present suspended. Mr. Chapman, one of the owners, spent some days at the mine last week. He publicly expressed himself highly satisfied with all that Mr. Davis has done. He has since returned to San Francisco, and will make such report to his partners as will govern their future actions.

GREEN MOUNTAIN.—No new developments yet to report in the big tunnel, the drift goes ahead rapidly and steadily, the ledge does not yet prospect enough to warrant milling any of the ore, but is of such character as to justify belief that pay will soon be reached. In the meantime ore enough is taken from the upper tunnels to keep both mills fully supplied.

PLUMAS CON.—Nothing at all is being done at the Plumas Con. A contract was let some months ago for an extension of the main tunnel; this contract was finished some time ago, leaving the face in solid granite, where it still rests, and is likely to.

GOLD STRIPE.—On last Wednesday the mill was started up, but will be kept running day shift only for some time. Some prospecting is kept up, and upon the result of this, future operations will depend.

Shasta.

SOUTH FORK.—Cor. *Shasta Courier*, June 30: Robinson & Co.'s arastra is running as usual. The mine looks well and is yielding some fine silver ore in addition to the decomposed gold bearing ore.

J. B. Strong is mining and having a run of ore put through E. L. Ballou's arastra.

Wright & Ormsby are getting good ore and expect to make a good run.

Crum's arastra is idle now but will start as soon as they can get some ore down from the mine.

The Manzanita is yielding as well as ever.

Smith & Cooper's arastra is running and their mine yielding as usual.

Water is abundant at present, but gradually failing.

Trinity.

A REGULAR BONANZA.—Trinity *Journal*, June 30: While at Bolt's Hill on Sunday last we had the pleasure of meeting Mr. T. J. Blakemore, and from him learned that the recent quartz discovery made by "Uncle Jim" Blackmore near Eastman Gulch, was turning out much better than had at first been anticipated. Sixteen and one-half tons of the rock ground in the arastra produced $2,500, or at the rate of $150 to the ton, and the rock which they are now running is variously estimated at from $200 to $400 to the ton. The lode has well defined walls, and widens and improves as they go down on it. Under these conditions, it is not surprising that the Blakemores last week refused $50,000 for their mine, the offer being made by a justly celebrated quartz mining expert from San Francisco. The Hickey mine, in the same district, continues to pay largely, and with every indication of permanence. Much prospecting is now being done in that vicinity, and in several instances splendid prospects have been found.

BULLYHOOP.—The development tunnel on the south end of the Mammoth is being pushed vigorously, working three shifts night and day. Length of tunnel at date is 165 feet. According to estimates, 20 feet further will strike the ledge, showing the vein at the depth of 185 feet. If the showing proves as good as the surface prospects, our camp is made. The Bullychoop Co. are cleaning out the old shaft on the ridge. This shaft yielded upwards of $6,000, but on account of bad management was allowed to cave, and the work on the tunnel was prosecuted in view of tapping the chute from below. The Davis Bros. are fitting up their mill, and expect to take out rock from the old workings as soon as the water lowers. Thomson has opened a new drift south in his upper shaft, showing some very fine rock and widening fast in the face. The Cumberland Co. are getting encouraging prospects. The ledge is the first north extension of the Mammoth, and bids fair to rival it in size and richness. The property is in the hands of a company of Red Bluff men, who intend to test its merits for themselves.

NEVADA.

Washoe District.

HALE AND NORCROSS.—*Enterprise*, June 30: The winze on the 2600 level is down little over 40 feet. Streaks of ore that assays well are still being found at the bottom of the winze. These are supposed to be feeders of a large ore deposit lying further to the west. The water winze on the 2400 level down to the top of the 2500 station. They now have between 700 and 800 feet of drifts to drain.

UNION CON.—The south lateral drift on the 2700 level is being overhauled and retimbered. The joint Sierra Nevada cross-cut on the 3,000 level is out 73 ft from the winze. The face was yesterday in hard, green porphyry. There is no water coming in. The rock does not break well in blasting, and rapid progress cannot be made. The ore vein cut on the 2900 level is supposed to be farther ahead.

OPHIR. Very good progress is being made in cleaning out and repairing the old Central tunnel, but in some places it is found to be badly caved. Are also repairing the ladders and track in the main ineline. Ore is still being regularly extracted from the croppings. The yield of ore from the old upper works will be greatly increased upon the completion of the repairs to the old Central tunnel.

SIERRA NEVADA.—Thus far no sign has been seen of the ore vein found on the 2900 level.

SAVAGE.—No work is being done in the mine at present, nor can any explorations be economically made until the Hale & Norcross winze connects the 2400 and 2600 levels, and gives a free natural circulation of air upon which to draw.

CALIFORNIA.—The C. and C. winze is being sunk at the rate of about 10 feet per week. The south drift on the 2500 level is making the usual progress.

BEST AND BELCHER.—The northeast drift on the 2500 level is being advanced at the rate of about 25 feet per week. It is still in vein porphyry, and is out over 425 feet.

MEXICAN.—On the 2700 level are cleaning out the drain in the west cross-cut. The main north

lateral drift on the 3100 level is being driven ahead as rapidly as possible.

NORTH GOULD AND CURRY.—The bottom of the shaft is still in rock that shows stringers of quartz and seams of clay. The predominating rock is vein porphyry.

SCORPION. The usual progress is making in the west drift on the 500 level. There is no water, and the material remains unchanged.

ALTA. Rapid progress is being made in the drain drift to connect with the Sutro tunnel. Work is being pushed at both ends of the drift.

ANDES. The prospecting sections show some quartz of fine appearance, and some paying ore is still being extracted.

GOULD AND CURRY. On the 2500 level west cross cut No. 2 is making good progress in vein material of a favorable appearance.

YELLOW JACKET. Are taking out about 150 tons of ore per day at the Winters shaft. Are still re-opening old drift and stopes.

Aurum District.

FINE PROSPECT.—White Pine *News*, June 30: Judge Stearns, who has returned from Aurum, informs us that the people over there are highly elated over the prospects in the mines of that district. Very flattering developments have lately been made in the Blue Bell mine. The Judge saw some of the ore, which he pronounces first-class, and they say they have lots of it. We are pleased to note this encouraging sign of prosperity among our neighbors. Dr. Brooks and Mr. Mikel deserve success. They have worked hard to acquire such a result. May their sanguine hope be realized.

Columbus District.

NORTHERN BELLE.—*True Fissure*, June 30: There has been very little change in the appearance of the mine since last week. A large amount of prospecting is being done in all directions, the same being pushed ahead as rapidly as possible. The southwest drift on the fifth shaft level has been extended 10 ft; its total length is 133 ft. The ground in the face of this drift has become much softer within the past two days. The crosscut to the south has been advanced 11 ft in the same formation as last reported. The total distance run to date is 117 ft. Owing to the extreme heat in the face of the main drift on the fourth shaft level, eight shifts of men are now doing the work. The stopes on this level are producing the usual quantity of ore. Both mills are running steadily and doing good work. The crushing for the Great Western mine has been completed, and mill No. 2 is now engaged entirely upon the company's ore. The bullion shipments amounted to $14,161.25 for the week ending June 28th, and aggregate $41,778.69 on June account to the same date.

MOUNT DIABLO.—The stope near winze No. 1 is turning out a little $50 ore. The stope east of lower winze No. 2, shows some 2 ft of $70 ore, while the intermediate drift, between the second and third levels, nearly above winze No. 1, is yielding some $150 ore, from an 18-inch streak that carries some waste. The stope above the west drift from the Callison winze is looking well and turning out more ore than a week ago. The ledge will average fully 3 ft in width for a length of 100 ft, the grade of the ore being something over $100 per ton. A shipment of bullion valued at $3,959.72 was made June 21st, and one of $9,286.10 June 25th.

Mount Cory District.

MILL AND MINE.—Esmeralda *Herald*, June 30: The new mill for the Mt. Cory mine will be built after the pattern of the Geddes and Bertrand mill, close to Eureka. It will consist of a revolving crusher and a Brockner furnace, and will have a capacity of 80 tons every 24 hours. It is to be completed by the first of September, and will cost $150,000. The Mt. Cory mine is jointly owned by J. C. Flood, J. L. Flood, George R. Wells and Alexander G. McKenzie. The company is a strong one, and will undoubtedly soon bring their property—which promises well—to the front as one of the leading bullion producers of the country.

Northumberland District.

LOOKING WELL.—Belmont *Courier*, June 28: Mr. George, of Northumberland, was in Belmont on Monday. He reports that the mines in that district are looking tiptop. There is considerable ore on the dumps, and good bodies of it in sight in the mines. The mill will start up about the 1st of next month, when bullion shipments will be in order.

YIELDING.—Belmont *Courier*, June 30: It is expected that the Northumberland mill will start up on ores from that district some day next week. The mines are yielding the usual quantity of good ore.

Pioche District.

MEADOW VALLEY.—Pioche *Record*, June 26; On Wednesday we were up at the Meadow Valley mine taking a look at what is called the "new strike," and in company with Supt. Duff we entered the mine. The strike was made in the old Fitzhugh tunnel, and is in a distance of 600 ft from the entrance of the tunnel on Meadow Valley street. The ledge has been sunk on about six ft from the bottom of the tunnel, and is nearly four ft in width from wall to wall at the place where work was then being done. Some five tons of this ore was sent to Dry Valley mill, and the pulp assay went $44 in silver and $6 in gold, the total pulp assay being $50. This discovery is nothing new. The workings of the mine shows this. The ore above this point was all extracted years ago. The ore had all been extracted down to the tunnel level in early days, then it becoming of low grade, it was abandoned, very probably because in those days $50 ore would not pay. It is simply the continuation of the ledge, where work had been left off. In the tunnel level, on the ledge, several winzes have been sunk by chloriders, who finally abandoned them. In some of the winzes the ore is said to go from $50 to $80, at the bottom. At the present time $50 ore will pay a company a handsome profit.

Reveille District.

GOOD ORE.—Belmont *Courier*, June 30: Work progresses satisfactory in the mines at Reveille. Good ore is encountered daily. The weather is said to be very warm in that district.

Safford District.

ANOTHER STRIKE.—Virginia *Enterprise*, June 28: It is now reported that a good strike was made last Saturday in the Good Luck mine, Safford district. A streak of ore has been found that is four ft thick, which assays several hundred dollars per ton. Samples of the ore which were brought from the mine look as if they had been burned black, but flakes of horn silver could be seen all through them. The gangue is not quartz, but black spar, which gives the ore a burned appearance.

Schroeder District.

THE NEW DISTRICT.—Safford *Express*, The new mining district lately discovered by C. E. Ferguson of our village is situated in this county, 13 miles north of the C. P. Railroads, and known as Schroeder District. Rich deposit of copper ore and nickel have been discovered, besides lead carbonates assaying high in silver. The ores resemble those of Eureka, and are similar to them to a great extent. The principal mines now located are the Pride of Nevada, Chicago and Sandy Jim, which are being now operated by a Chicago firm.

Silver Point District.

DEVELOPMENT.—Belmont *Courier*, June 30. The work of development goes bravely on in the mines at Silver Point, and the ore from that district is being hauled to the Jefferson mill for reduction.

Tuscarora District.

TUNNEL.—*Times-Review*, June 28: The contract for running an additional 50 ft in the Tuscarora tunnel has been completed. The formation in the face of the tunnel is undergoing a change, the rock becoming harder and more regular, with considerable moisture, all of which are regarded as favorable indications. Another contract is to be let soon.

Tybo District.

MILL START.—Belmont *Courier*, June 30: The Tybo mill will soon start up on company's ore, and a long profitable run is confidently expected.

Ward District

THE MARTIN WHITE.—Ward *Reflex*, June 29: Some wonderfully rich ore was struck in the Martin White mine north of the old whim shaft Wednesday last. Some pieces are nearly all horn silver, and as malleable as lead. One chunk of this character was taken out that weighs 35 pounds. Two wagon-loads of ore, in sacks, supposed to be worth several thousands dollars to the ton, have been taken to the company's office, it being considered too rich to leave at the mill at present. Don't all get excited at once. It is not all of the above character by any means. Where the work is going on, under the old croppings, not to exceed 15 ft from the surface, there is considerable ore in the face, but little is known about its extent. The ledge matter here is fully 25 ft wide. It was in this portion of the mine that the large and rich body of ore was struck that first attracted attention to Ward, and that has not been touched worth speaking of for a number of years.

A NEW DISCOVERY.—Safford *Express*, June 30: On Saturday last an important strike was made in the Good Luck shaft at Safford at a depth of about 25 ft from the surface. There was encountered a streak of ore fully four ft wide, assaying several hundred dollars per ton. Samples of the ore look as though they had been burned black, and is similar in a great many respects to the Onondaga ore. Flakes of horn silver are visible throughout the rock, which, being black spar, gives the ore a burned appearance. The ledge has widened considerable during the week and now appears to be a permanent thing. The owners are highly elated over the find, and propose continuing the work in order to assertain if "she goes down" a fact which will be welcomed by our community.

Washington District.

BIRDIE.—Grantsville *Bonanza*, June 30: We are informed that a rich strike has been made in the Birdie mine, which is located in San Juan canyon, Washington district, Nye county. This property is owned by Matsy Merton and R. W. Scott. There are several valuable mines in this district but very little work is being done on any of them at present.

ARIZONA.

JOTTINGS.—Prescott *Courier*, June 28: A. A. Alexander, superintendent of the Black Warrior mill and mine, arrived in Prescott Sunday night last, with two and one-half bars of fine silver bullion. The Howell Co. are making a great deal of bullion. The mill site will soon be graded. Copper mountain smelter not running. Three shifts are taking ore from the mine, Saturday last, the shaft in the Gavin mine was down 20 ft; vein strong and rich. Rumor hath it that Mr. McDonald recently found a rich deposit near that of Gavin & Co's. News from Trainor's camp, Turkey creek district, is encouraging. Lodes yielding well; smelter about ready for operations. Mr. Merrington has received a concentrator, for service at his Groom creek mill.

COLORADO.

NOTES.—Georgetown *Courier*, June 30: The Wallace is producing two tons of 300-ounce ore daily. The Eclipse is shipping about 15 tons of ore per month which mills nearly 300 ounces per ton. An air compressor is to be put in the Lehanon Tunnel. It will be operated by water power, and used in place of steam in mining operations. An air compressor has been put in place to run the drills on the Mendota tunnel in place of steam. The tunnel heading is now in over 125 ft. A chunk of ore about 20 inches thick, four ft wide and five ft long, was shot down last week in the Hennessy & Shay lease on the Mendota. A three inch vein of 300 ounce ore has been encountered in the Saxon Extension. The property is being worked under lease by Mr. R. Root. A vein of wire gold one-fourth of an inch thick, was struck at a depth of 34 ft in the Tariff lode, Ute creek, last week. The vein also shows 14 inches of quartz impregnated with free gold. The lucky owner is S. J. Kennedy. From a new discovery of Comstock & Lawrence, on Ute creek, specimens of free gold were taken at a depth of seven ft, valued at $150. The vein has also shown from grass roots a three-inch streak of ore assaying 180 ounces silver and one-half ounce gold per ton, and also another streak composed of galena, gray copper and zinc blende. The surprise that an assay gives one sometimes from barren looking lode matter, was illustrated a few days since, by the assay of quartz showing no mineral, from the High Line lode, on Griffith mountain, which gave a result of four ounces gold per ton. Mr. Colburn has been extracting some very fine ore from this lode recently, which mills 192 ounces silver per ton. Last week we mentioned the finding of good ore at the surface of the Sonora, on Griffith mountain. During the past week, work has developed nearly nine inches of solid ore that will probably mill in the neighborhood of 800 ounces per ton. Mr. Joseph Guanella, the owner of this property is justifiably enthusiastic over the prospect of a large pocket of high grade ore.

IDAHO.

CURTIS MILL.—Wood River *Times*, June 20: The mill of the Columbia and Beaver M. & M. Co. of Sawtooth will be started up in a few days, on custom ore, of which there are several hundred tons at the Pilgrim, Columbia and Beaver, Silver King, and Bidwell mine dumps. The mill men intend to charge $35 a ton for reduction, and will guarantee a yield of 90 %.

THE ALLEN GROUP SOLD.—Connor & McGregor yesterday purchased and paid the cash for the Allen group of mines on Warm Springs creek.

AN IMPORTANT STRIKE.—This morning news came in of an important strike in the Red Cloud mine, located on the south fork of Deer creek, and owned by A. L. Mason and the Porter brothers, of Bullion. While stripping the ledge on the surface, yesterday, they cut through a vein of high grade silver galena, from two to three ft wide. The Red Cloud is near the great Chicago and Green Mountain Boy mines, and is regarded as on the same vein as the former. The Chicago, owned by James Mahana and Chicago parties, is being developed by an incline shaft, which is sunk on the foot-wall in quartzite. The vein is on the hanging wall, which is a lime formation, and the course of the vein is north and south. It is, therefore, a contact formation.

CHINESE MINERS.—Idaho *World*, June 26: The Chinese Co. that have been working Plowman's drifting ground (on the south side of East hill) on shares, cleaned up last Saturday. The cleanup was $6,000. They have been at work since last fall. Plowman furnishes water and tools. The Chinese get 70% of what comes out. The cleanup was larger than was expected. They have commenced work again in the drift.

THE BIG CAMAS.—Matthew Williams, with several miners, is now at work on the Big Camas mine. The Camas mine was started 18 years ago, when Indians roamed this section, has been run into the hill 430 feet, but as no vein was cut at that distance in, and as the owners wish to realize some returns from the property, work was resumed yesterday on the surface. The outcrop for a distance of 800 feet along the course of the vein is 30 feet wide, and thousands of tons can be broken down and actually quarried out from the surface, as in most places the croppings stand several feet above the ground. The company expect to build a double-bed arastra mill, to be run by horses, and will locate it in the gulch below the mine, where they have some 30 miners' inches of water. The croppings run an average of $15 to the ton, and the formation is soft rendering the extraction of the ore inexpensive,

ON THE EAST FORK.—M. J. Brockway came in Saturday from the East Fork of Wood River, where he has been examining the mines during 30 days past, as well as on the Middle Fork of Little Wood River. On the latter he has discovered an immense iron mine which, he states, is 22 ft wide of solid ore and of a finer quality than yet found in the country. He located this iron mine May 10, and has since that time had it examined by a number of experts. The ore contains but little silica, and can be quarried out so easily that all the smelters can be supplied with iron for fluxing. The Faro King and Wasatch are also promising locations near by.

THE IDAHOAN MINE.—Willian H. Nye will visit Hailey after July 4, to see the Idahoan mine. Judge Turner is shipping ten tons of ore a day from the mine now, and expects to have the machinery, concentrating works, etc., very soon. T. J. Edington, another of the owners, is now in Denver and may go to Chicago to secure the machinery, which will consist of a rock crusher, Cornish rollers, pigs and concentraters. The water ditch has been completed and is now ready for the machinery. Judge Turner says they will secure the best machinery made for the purpose and as soon as it is set all the second and third grade ore which has been left standing in the mine will be extracted and concentrated

SUMMARY OF NEWS.—Wood River *Miner*, June 30: From parties just in from beyond the Sawtooth range, it is learned that J. D. Murphy is opening up the Atlanta mine, at Sawtooth and having considerable high grade shipping ore extracted. The Columbia and Beaver Co. are getting ready to start their mill and are prepared to buy ores from the mines and from prospectors in any amount, paying cash down. The mill management charge $25 per ton for milling, and return 85 per cent of the assay value or buy the ore on that basis. The prospects for flush times and lively camps at Vienna and Sawtooth are 200 per cent brighter than last year at this time. The Nellie group in Smiley gulch, has been started up again, and five miners are now developing the property, and more are to be added as soon as there is room to work them. The Rosebud, on the South Boise river slope, is a new location owned by Julian Riley, and assays gives an average of the ore at 400 ounces of silver to the ton. The roads will be open soon around Vienna, or in about ten days, and then the mines well ship ore to the mill, which is about completed and will be ready to run by the time the ore is at hand. There has been deep snow on the grade between the mill and the mine, and the hauling of ore has been delayed on that account. The lower tunnel on the Mountain King mine has cut a body of ore stronger and of higher grade than at any point in the upper workings. The Vienna mine is showing up finely, and producing ore rapidly from the stopes and the management will ship to Johnson's mill as soon as it starts up. The 20 stamps can be kept running constantly the entire season on ore now extracted and in sight.

MONTANA.

GREGORY.—*Inter-Mountain*, June 29: On the 600 ft west drift the character of the product shows a great improvement over that extracted from the levels above, for the ore at that depth appears as a solid body of galena varying in width from 20 inches to 4 ft and sampling 80 ounces in silver, 60% lead, and $20 in gold. This remarkably rich streak is found on the hanging wall for a continuous length of 175 ft from the 600 ft station. The foot wall side of the ledge has not yet been explored, nor has its distance from the hanging wall been ascertained. The daily output is about 35 tons which will be very largely increased on the completion of a projected concentrator which will have a daily capacity of 100 tons. A new hoist with a capacity to sink 1,000 ft has been already ordered and will be started into operation as soon as possible. On the Fourth of July when the Northern Pacific railroad celebration shall take place in Helena, the Gregory Co. will add a glory and importance to the event by the shipment of 1,000,000 pounds of silver-lead bullion from its smelter—the accumulated product of a long and very successful run.

NEW MEXICO.

NOTES.—*Southwest Sentinel*, June 28: Wyman & Co., shipped a carload of Bald Mountain ore to Pueblo, last Thursday. The William Bros. are still drifting south on the Sherman, and the ore body continues to show up well. Thos. Hall sold the Mogul mine, Pinos Altos district, last Thursday, to Bell & Stevens. Consideration, $6,000. About 40 house are now completed at Fleming, and building is still going forward. Tents are gradually giving way to houses. The Ruby M. Co., is employing a heavy force of men at Lone mountain, and is rapidly developing a number of its mines. The company has 75,000 ft of lumber at the mill site, and it is thought the mill will be up and the machinery running before winter. Jack Frost is working his shaft on the Home Ticket, Lone Mountain district. He is now down about 75 ft in a fine body of ore. The Home Ticket has always yielded 200 and 300 ounces ore. It is one of the best mines in the district and its assays have run up to 800 ounces. Owens, Swancoat and Richards are working on the Champion mine, about three-quarters of a mile northeast of Camp Fleming. They are in granite and are down 15 ft on a clearly defined ledge some 18 inches wide. The ore assays from 400 to 600 ounces to the ton. T. M. Hall is working, or as he terms it, prospecting, the Alice and Carrie mines on the west slope of Pinos Altos mountain. On the Alice he is down 50 ft, sinking along a porphyry wall. The work is mostly in lead carbonates running from 20 to 30 ounces in silver. The Carrie is the adjoining and parallel claim, and shows heavy iron croppings. A shaft has been commenced at this lead and is now down about 20 ft. A splendid body of ore has recently been exposed on Houston & Thomas' Alpha and Omega mine near Pinos Altos. A cut 150 ft in length and averaging six ft in depth has been run along the vein or deposit of ore, and then the entire surface stripped a distance of 65 ft back from this cut and for fully 100 ft of its length. The enormous body of ore thus exposed is of precisely the same character as that shipped sometime since, and which by actual mill tests runs—first lot $23.40, and second lot $29.80 to the ton. Worked on the ground in a Mexican furnace, it yielded 27 ounces to the ton. F. C. Taylor having failed to meet the third payment of $20,000, on the Old Man mine at Camp Fleming, due on the 15th, his working bond was forfeited, and the property reverted to J. W. Fleming and his associates, the original locators. The owners are still pushing work on the mine, having let a contract last Wednesday for a shaft to be sunk 50 ft deep on the contract. June, one of the owners is now in Albuquerque, sampling ore shipped under the Taylor bond, for which no returns had been made at the expiration of contract, and which of course became the property of the original owners. Mr. Taylor gave an order for the same promptly upon the forfeiture of his bond. Upon June's return a full force will be put to work upon the mine.

TELEGRAPH DISTRICT.—Cor. *Southwest Sentinel*, June 30: The main incline on Mother lode has reached a depth of 105 ft. Ore body is six ft thick, of good milling ore. This ore body is still compact and shows no indications of weakening in quantity or quality. The ore samples about 35 ounces per ton. The drift at the 100 level running south is in 36 ft showing a thickness of six ft of 50 ounces free milling ore. The north drift on same level is in 31 ft showing six feet blanket ore, richer than that of the south drift. The main shaft on the Good Hope is now 41 ft deep and is being pushed as fast as possible. It is expected that this shaft will reach the ore contact at a depth of 75 or 80 ft. The shaft at south end of claim shows three ft of chloride ore, that will mill 18 ounces. A phenomenal strike of rich ore was made on the Tecumsch this week, in the discovery of the continuation of the Mother lode. The deposit has been stripped a distance of 120 ft. Average thickness from 5½ to 6 ft. This ore is very high grade, and will equal if not surpass any yet discovered on the Hill. The stripping is being pushed rapidly, and by another week an ore body will probably be exposed that for strength and richness has never before been found in the Territory.

AVERY.—At the 41 level the drift is in 11 ft, showing 4 ft vein of sulphuret ore that is probably the richest average ore in the camp. Carefully sampled from wall to wall it assayed 175 ounces. This is a fissure vein in granite, and the improvement in the results of the last week's work is something extraordinary. Mr. John T. Mitchell, under whose supervision this work is being carried forward, is confident that the ore bodies so far exposed give evidence of a strength and richness that will place this camp among the leading bullion producers of the Territory, when the reduction works soon to be erected are in operation. All the ore so far discovered in the principal mines is an absolutely free mill ore, and with the facilities that the camp affords for cheap reduction, can be milled as low as 8 ounces with a fair profit.

UTAH.

PARK CITY MINING NOTES.—Salt Lake *Tribune*, July 3: At the Disappointment mine the force of men has been increased and the first carload of ore will be shipped to-day. The Silver Key may now be considered a regular producer. This week three carloads of ore were shipped from this property. More will follow right along in regular order. Mr. Pearson is now engaged in making preparations to commence work on the Pioneer. He is fixing up his cabin and getting things in shape to put on a force of men and push the work of development ahead. White Pine canyon will be a lively place this summer and we hope rich lodes of ore will be uncovered there before snow flies next fall. There is some valuable lime rock in this region. A couple of prospectors, in working on a ledge this spring, uncovered a quality of rock which suited the fancy of a citizen of Salt Lake, and he unhesitatingly offered them $400 for the claim. The boys have the matter under advisement, but they are inclined to believe that farther on there is something more valuable than lime rock in their ledge,

High Prices for Prospects.

The following suggestive article is from the Butte, M. T., *Inter-Mountain*: Mr. F. Melvin Chadbourn, connected with the Mining Bureau of the London Mercantile Association, has been in Butte for the past month. During his visit here he has occupied himself in examining the silver and copper mines of Butte, and speaks in very favorable terms of their extent, richness and productiveness. It is understood that Mr. Chadbourn's object in coming here was to bond some good properties and place them in the London market. But the gentleman intends to leave on Thursday morning on his return to England, and learning that he had made no arrangements to bandle any of the Butte properties a reporter this morning stopped the gentleman on the street and inquired why he did not succeed in his mission, and why he proposed to go away so soon?

"Well," was the reply, "I had heard before coming here that there were many fine mining properties here possessing every favorable indication as to size and permanence, but still idle for lack of capital. They were many of them owned, I was informed, by poor men, who, fully aware of their own inability to work them, would give a liberal, or at least a reasonable 'layont' to any one to agree to develop them under lease and bond, and that the bond would not be placed at any exorbitant figure."

"What did you find on your arrival?"

"I found a part of the report to be strictly true. I found more promising prospects than I ever saw in any other ten mining camps I ever visited. I found forty, fifty and sixty foot shafts sunk on ledges of great promise—ledges with smooth, well-defined walls, regular dip, uniform width and fine veins of ore. Many of them are idle because the owners have no money to buy pumps and hoists or money to put up mills and smelters, or to take out ore and have it worked at the present custom rates. These properties, you should remember, are not mines but prospects, and in most of them not a pound of ore is in sight below water level except what the main shaft exposes. They may all be capable of very profitable development, and such is a reasonable presumption judging from the experience with other properties which have been opened. But English capital is no longer invested on merely presumptive evidence. That kind of business is played out long ago, as did many of the mines which were bought on a surface showing. The policy of mining investors has changed, and while they are still willing to pay a good price for a good property, one of ascertained value, they will pay nothing for properties which have not been opened and proved. We realize how difficult it is sometimes to purchase a developed mine and we are therefore willing to develop them provided that if they suit us we can have the option of purchasing them. But here an insuperable difficulty intervenes.

The prospector either demands a tremendously high cash price, or an enormous bond and a gigantic forfeit. We protest, and they say to us: 'your policy doesn't give us a square deal. You open our properties and take them if you are suited; if not, you throw up your bond, and we have on hand a worthless property, or else one with a very black eye. We take the chances and you get the money, if the mine proves a bonanza.' This kind of talk is what a man always gets when he wants to bond a mine, and unless he is willing to bond at five times the cash price, and pay a forfeit besides, if he does not take the property he is called a shark and looked upon as a speculating adventurer. This is an extreme injustice to the agents of capital, and unreasonable too. For instance, what honest man would sell a property at a high figure, which a little development would prove to be worthless; and, *per contra*, if a prospect owner has confidence in the extent and value of his mine, why should he refuse to bond it and have it developed? If it opens well, he gets what he was willing to sell for, cash down, and the bigger it is, the better for him, the purchaser and the district."

"Have you had any trouble such as that you speak of?"

"Yes. There are half a dozen properties here which I should very much like to bond, and they show well on the surface and look very promising. If I could get a reasonable bond I would develop them, and my impression is that they would open up well enough to justify me in negotiating their sale. But I cannot afford to take any chances. One man in particular came to me and offered a property that impressed me most favorably. It has been idle for four years, and is likely to be idle for four more. He would take $15,000 in cash, or bond it for 60 days for $50,000. I told him I would bond it for six months for $25,000, and he indignantly left me. I have had a similar experience a number of times during the past month, and the only thing for me to do is to go away and wait till next year."

"Then you think that time will bring about a change?"

"I do. At least one of two things will happen; either Butte will have a big boom this year or operations will continue to be conducted by the big companies now here, and little outside capital will be introduced. Within the next six weeks or two months a great many mining men will visit Butte because the fame of the camp is rapidly spreading, and it has a better reputation abroad and at home than any other American camp. These incoming capitalists will either buy mining properties at ruling prices or go away dissatisfied, refusing to invest a dollar. For myself, I concede the right to every prospect owner to get all he can for his ground. I should do the same; but since you asked me a pointed question about my success in Butte, I have seen fit to give in reply a plain statement of fact.

PARADISE GOLD MINES.—J. M. Miller, in company with J. S. Clapp, recently visited the mines in the vicinity of Paradise valley, and is very much pleased with the prospects there. The main leads so far worked on are the Eagle and the Vulture, situated about two miles in a southerly direction from the springs. He made a close examination of the Vulture. It crops out boldly for a distance of 600 feet. The lode is well defined, and whenever work has been done shows a body of pay quartz from two to four and a half feet wide. He tried about 50 samples from different parts of the lead with a prospecting horn, and found it would work from $5 up to $150 a ton, free gold, and he is satisfied that it will develop into a valuable property, with a small amount of capital judiciously invested. The formation is granite. The springs, which are owned by the Vulture Company, consist of three—two warm and one cold—and afford quite a supply of water, an abundance for mining purposes, but there is no fuel there except about 100 mesquite trees, which offer a delightful shade. The distance from the Pioneer Mill, at Hawley's station, is 18 miles over a good road, which passes by Coyote Holes, 10 miles from the station, where there is plenty of water.—*Calico Print.*

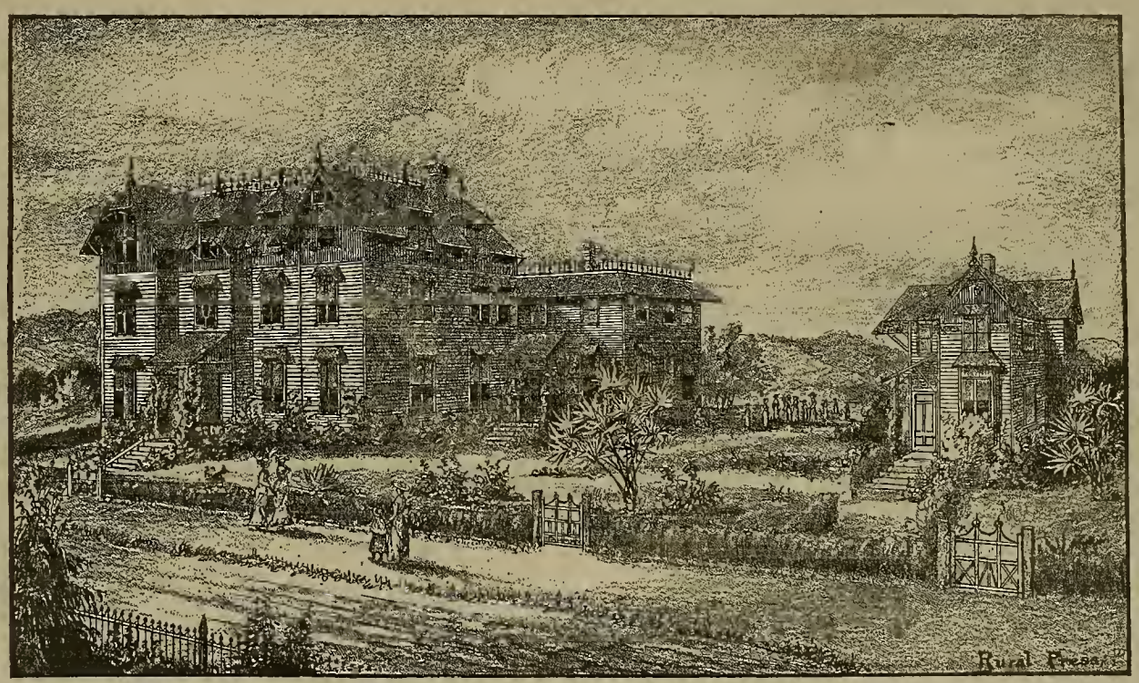
THE KEELY MOTOR AGAIN.—The president of the Keely Motor Stock Company, Mr. Edward Randall, of Brooklyn, is one of the officials of the Erie railway, and he is a firm believer in the successful application of the new power which he thinks Mr. Keely has discovered. "There is a discovery without any sort of doubt," he said yesterday; how he is going to apply it is the only question which troubles us. The Erie engineer, Mr. Canute, says it is some new and to him mysterious motor, and he has been the generator repeatedly. We are now building," added Mr. Randall, "a locomotive of 500 horse power, with which we propose to draw a train of Pullman Palace cars from Philadelphia to this city." "At what time?" "In August next." "And in what time?" "Ah!" that remains to be seen."—*N. Y. Tribune.*

The Harmon Seminary.

We give a sketch of the Harmon Seminary for young ladies at Berkeley. The engraving although it hardly does justice to the pleasing details of the buildings and surroundings gives an idea of the exterior features of the institution: The Seminary Building, which was erected in 1882, is pronounced by all who visit it a model of excellent construction and tasteful finish. It was planned with special reference to its use as a Boarding and Day School for Young Women. It is a commodious, three-story, suburban villa. Its interior, aside from rooms for general use, has been arranged to secure a cluster of neat and cosy apartments, instead of the cheerless dormitories which are too prevalent in boarding-school architecture. In both its exterior and its internal arrangement and furnishing, it presents the characteristics of a comfortable and commodious private residence, and the impression imparted to the pupil on entering is that of access to a home and not a public edifice. Thus the building is made to conform to the central idea of the institution, which is to combine the influences of a refined and cultured home with the discipline of the school and class-room.

The Seminary is entrusted to the management of Rev. S. S. Harmon and Mrs. F. W. Harmon, who have had an experience of more than twenty years in the education of young ladies in this State. The present institution embodies the results of their ripened judgment in its plan and policy and the accommodations and arrangements are such as their wide observation and experience designated as most desirable. It is not an ambition of this school to bring together a large and imposing array of pupils. Its numbers are limited; hence, each pupil receives that close personal attention and instruction rendered impossible where multitudes are gathered together. The institution is well supplied with instructors in the common branches, and thorough work is done. In the special branches of music, art and laugnages, the masters are among the most eminent in the State. The courses of instruction are various and include all degrees of advancement from the kindergarten upward. The regular course leads to the diploma of the Seminary. There is a special course for those who desire to enter the State University, and special courses, also, for those who desire to advance themselves in music, the arts or literature. The range of instruction is very broad, and, in addition to the matters usual in similar schools, it has practical instruction in floriculture and horticulture for those who desire it; and in silk culture, which is now becoming prominent as a household industry in this State.

The seminary closed a very successful year on May 30th, and the next term will open July 26th.



THE HARMON SEMINARY, FOR YOUNG LADIES, BERKELEY CAL.

DANGER.—Every person must try to learn what dangers are connected with his trade or profession and how they may be avoided. Some of these dangers are dust, lead, quicksilver, arsenic, coal-gas, carbonic acid gas (found in wine and beer cellars), and the poison of dead bodies and sick animals.—*Wolfberg.*

IT IS sagaciously noted that to determine the value of building stone a ramble among the tombs is wise. In far fewer years than most imagine monuments are in decay.

Union Mining District.

There are probably as many mines in this district on which nothing is being done as in any section of the State. Mines that, if properly handled, ought to yield a large amount of the precious metals, and prove a source of profit to the parties operating them; but for some reason they are closed down, and are of no benefit to their owners or any one else. It is claimed by many that the patenting of a mine is generally the means of closing it down. The mines of Ione have been shut down for years, and it is a well known fact that there is not one of them patented; the owners make a pretense of doing the assessment work necessary to hold them, and then lay back and refuse to sell for anything but fabulous prices. There are other sections of this district suffering from the same complaint. Mines are held by parties who won't work them themselves nor allow any one else to.

The most extensively worked mine in this district was the Alexander, which in the course of a little over three years produced nearly a million and a half of dollars in silver. A little over one year and a half ago operations were stopped on this property, but the lack of ore was not the cause. Competent mining men say there is an immensity of ore in sight, and, as yet, no depth is attained in the mine; that the ore goes down there is no doubt, and it is almost certain that the ore bodies will show no decrease in size and richness. The Brooklyn also produced large quantities of good ore, but now it lies idle and unproductive; parties who know say it has still got good bodies of pay ore in it. Capitalists looking for mining properties capable of producing large quantities of ore can find several in Union mining district. The mines of Ione alone, worked systematically, are capable of producing ore enough to make them dividend payers, but a moderate outlay of capital would be needed to open them so that ore could be taken out advantageously. John Centras' mines, at Centrasville, are also well worthy the attention of those who are seeking a good investment. In the leading mine there is a fine strong ledge carrying high grade ore. In Union canyon there are numerous prospects on which considerable work has been done that show more or less ore of a good grade.

The McMahon & Irvine C. M. & M. company have resumed operations in the Centennial. This mine has every indication of developing into one of the most valuable properties on the coast, but it will take coin to open it and make it a bullion producer. In the main tunnel ore of a high grade has been cut, and as the face of the tunnel is advanced, it continues to come in stronger. Preparations are being made for the erection of a ten-stamp mill (with a capacity for twenty stamps) to reduce their ores. We sincerely hope that the efforts of the management will be crowned with success, and that the hearts of the stockholders may soon be gladdened by the payment of regular monthly dividends for years to come. [Since writing the above all operations have been suspended in the Centennial mine and the work of grading stopped for the mill, for what reason we know not. One thing is certain, however, the mine looks vastly better now than at the time machinery for the mill was ordered. If it is the intention of this company to open their mine in a thorough and systematic manner, and work it for what it contains, and not as a stock gamble, they can rest assured it will take capital to do it. Starting up a property and running it for a few days and then closing it down, not only hurts the reputation of the mine but does serious damage to every other mining property in its vicinity.]—*Grantsville Bonanza.*

SELFISHNESS AND HAPPINESS cannot flourish on the same stem. He who cares only for himself never finds what he seeks; he grows narrow, stunted and mean, and becomes at length incapable of any but the meanest enjoyment. It is as if he were surrounded by flowing streams, and, though athirst, has not the power to drink of them. It is only the man of generous impulses who can know what real happiness is; but to develop these impulses in the right direction and make them truly valuable to mankind, thoughtful intelligence and wise discretion are indispensable.

Better Metallurgical Methods.

The metallurgical processes of the present day are not up to the standard required by the position and importance of the mining industry. This position is, doubtless, largely due to the fact that scientific men have not given the subject the attention which its importance demands, and the business has been conducted, to a large extent, at a remote distance from business centers, and the presence of skillful and well informed men. Under the present methods the element of loss is too great a factor—loss of time and valuable material. In many localities the most primitive methods and agencies are in use in the reduction of ores; appliances that show no improvement in the whole history of mining for centuries.

In almost any other department of the mining industry, especially in the working of mines, a marked advance is everwhere apparent. The compressed air drills, the steam hoisting machinery, the improved explosives, and all the arrangements for mining the ore, show but slight resemblance to those in use even a few years ago. As mining comes more and more a productive industry, and is operated in a legitimate manner, for the development of mineral resources, the condition of facilities and the unsatisfactory results of present processes for the reduction of ore must demand attention and compel a revolution in means and methods. The product of the mines of the country is estimated from the portion of mineral that appears in the channels of industrial and commercial activity. If to this utilized portion could be added that which has been lost between the mouth of the shaft and the bullion mould, the result would be surprisingly different. Estimates of the Treasury Department show a decrease of the gold produced in California, during the past year, amounting to $1,000,000. We will venture to state that it is more than probable that the tailings of mill and flume have borne away more than five times that amount within the year, and the annual loss of precious minerals, under present methods of treatment, would more than pay the cost of all investments made. Under careful management the waste dump, slag pile and tailings, even with prevalent means, have, in many instances, given better results than the mine from which the ores were taken. This ruinous factor of waste must be eliminated before the problem of successful mining be definitely solved. Mining, grand as is her present showing, never can be truly estimated in the full measure of her magnificent resources until this vampire of loss shall release its paralyzing grasp.—*Idaho World.*

An Electric Sluice Box.

We witnessed this morning the operation of a new style of sluice box, to be used on mill tailings and in washing gravel. The appliance is a new one, the patent on which has been applied for by C. H. Wetzel and F. J. Taylor. The sluice box used is the ordinary shape and size, in the bottom of which are arranged wedge-shaped riffles, two abreast, but with the ends reversed in every set. The riffles are each about a foot long, and all are covered with a sheet of zinc and copper, the copper being next to the wood. The copper plate has the zinc fastened to it so that the zinc is not allowed to touch either the riffles or the side of the box. In this way it is claimed that an electric current is generated that precipitates and catches all mineral in solution passing off in the tailings, and at the same time a stronger affinity is created between the mineral in its natural state and the plates. The reversed motion given the water and pulp in its passage through the sluice box, by means of the alternated wedge-shaped riffles, will, it is contended, bring every particle of mineral in transit in direct contact with plates; which, being charged with both electricity and quicksilver, will seize and hold the same. There is also suspended in the sluice box a small wheel with copper arms that are also charged. The current of water passing underneath this wheel revolves it, thus again bringing a charged copper surface in contact with the "slimes," and floating mineral in the water. Those two latter substances have baffled the efforts of mill men in times past to successfully work them. At the end of the sluice box is arranged a reservoir, copper-lined, into which all the pulp is emptied. In the center of the reservoir a gate is placed that prevents any pulp from running off into the waste pipe until it has been churned and brought in contact with the metal lining, which gives the apparatus still another chance to seize what mineral may have avoided contact above. Mr. Taylor is making a test of the invention on tailings at the Centennial mill, and a number of mining and milling men who have witnessed its operation have high opinions of its merits and speak confidently of its success.—*Inter-Mountain, (Butte, M. T.)*

MESSRS. WM. T. COLEMAN & CO., of San Francisco, have purchased the defunct Standard Soap Co.'s fine plant at Alameda Point, which they will use as a borax factory to refine the crude mineral from the Death Valley mines.

THE SAN FRANCISCO MINING AND SCIENTIFIC PRESS speaks favorably of the substitution of silver for iron in making shoes and dies for amalgamating pans. It has been tried in this Territory with good results.—*Prescott Courier.*

USEFUL INFORMATION.

How Tea is Adulterated.

The New York Tea Appraiser has completed the investigation of the cases of teas brought to this country by the Flintshire, and found that a large proportion of it is grossly adulterated. He to-day presented his report to the Collector, showing that he had rejected 3,100 packages, which if sold in the market might have there realized about $22,000. These teas consisted of greens of all colors, sizes and descriptions, some of which were mixed with sand, some with gravel, others composed of exhausted leaves, and still others being composed of dirt and paste rolled into pellets. Above five hundred packages of colored Japan dust were also rejected on the ground of high color and the admixture of mineral substances, intended to make the tea heavier in weight. This tea was also brought to this country by water, on board the Flintshire.

The Collector and Appraiser of the port of St. Louis have forwarded to Davies samples of the so-called tea sent to this city by way of San Francisco. The examination has clearly shown that the stuff was only wild leaves, indiscriminately collected and dried and sent to this country to be palmed off as tea. This was intended to be sent to a part of the country remote from the regular markets, and there disposed of as tea, regardless of the fact whether or not it was an injury to consumers. Davies said this morning that the new crop now arriving overland appeared to be of good quality.

TO MEASURE THE FLOW OF STREAMS.—The *Manufacturer and Builder* gives the following very simple method: To measure water roughly in an open stream, take from four to twelve different points in a straight line, across the stream, and measure the depth at each of these points, and, adding them together, divide by the number of measurements taken. This quotient will give you the average depth, which should be measured in feet. Multiply this average depth by the width in feet, and this will give you the square feet of cross section of the stream. Multiply this by the velocity of the stream in feet, per minute, and you will have the cubic feet, per minute, of the stream. The velocity of the stream can be found by laying off 100 feet on the bank, and then throwing a board into the stream at the middle, note the time required to pass over the 100 feet, and dividing the 100 feet by the time and multiplying by sixty gives the velocity in feet, per minute, at the surface. The velocity at the center is only eighty-three per cent of that at the surface, and so only eighty-three per cent should be calculated. For example, suppose the float passes 100 feet in ten seconds, this, divided by ten and multiplied by sixty, (seconds in a minute) gives 600 feet, per minute, as the velocity, and eighty three per cent of this gives 498 feet, per minute, as the velocity of the stream at the center, and the area of the cross section, multiplied by this, will give the number of cubic feet, per minute, in the stream.

OUR BIRDS.—It would be well if a little more information were imparted in our schools on the subject of our birds, song birds especially, for the amount of good work done by insect-eating birds is something wonderful. A writer in *Good Words* gives an illustration of the enormous appetite of the bird. A thrush will eat at a meal the largest snail that England produces. If a man could eat as much in proportion, he would consume a whole round of beef for his dinner. The redbreast, again, is a most voracious bird. It has been calculated that to keep a redbreast up to his normal weight, an amount of animal food is required daily equal to an earthworm 14 feet in length. Taking a man of average weight, and measuring bulk for bulk with the redbreast, and assuming a sausage nine inches in circumference to be a fair equivalent of the earthworm, it is found that the man would have to eat 67 feet of such sausage in every twenty-four hours. By these two examples it will be seen what slayers of insects our birds are, and it seems almost beyond belief that they should be slain. If information such as the above were more widely disseminated, we should hear less of the practice, injurious as it is wanton, of bird's-nesting and bird-catching, in which boys and young men take only too much delight.

PAINT FOR BOILER FRONTS AND SMOKE STACKS.—The *Manufacturer and Builder* recommends the use of the Silico-graphic paint, so called. It is furnished already mixed, and may be further thinned down with oil when desired thinner. The practice reported by one of the master-mechanics at the Hornellsville shops of the Erie Railway Co., on locomotive smoke stacks, it strikes us, would be useful to follow in the case of boiler fronts. His practice is to rub the paint into the iron with waste, and, sift over it some finely powdered blackhead, and polish briskly with a brush. The result is reported to be a rich, glossy, smooth black surface, which will not burn off, and is very durable.

NEW USE FOR THE POTATO.—If what the *Agricultural Gazette*, of Vienna, gravely states is true, Ireland may potentially possess a gigantic fortune in her ability to raise innumerable potatoes. That paper says that the humble but indispensable tuber may be transformed into meerchaum pipes of the first quality, and likewise into any article now made of ivory, by subjection to the following treatment: Having been carefully peeled and suffered extraction of its "eyes," the potato is boiled steadily for 36 hours in a mixture of sulphuric acid and water, after which it must be squeezed in a press until every drop of natural or acquired moisture is extracted from it. The residuum of this simple process is declared to be a hard block of a delicate, creamy, white hue, every whit as suitable to the manufacture of ornamental and artistically executed pipe-heads as the finest clay, and unsurpassed as a material for brush and umbrella handles, billiard balls, fans and chessmen.

GOLD GLASS.—There appears to be quite a run of late by manufacturers upon novelties in expensive gold and silver artistic glass. The executors of the late Joseph Webb, of the Coalburn Hill Glass Works, Stourbridge, have entered the lists, and have brought out what they term the "New Gold Glass." It is made in various ornamental shapes for the drawing room. The surface has a crumpled appearance, colored with gold, which is worked into it in the course of manufacture. The gold surface is not to be compared to gilding, it being, as it were, a top layer of the glass, and is brought in combination with different colored bodies. Some are worked out in green, and others in amber glass. The elevation of the crumpled shapes admits the light through, which throws up the tinge and adds to the effect. This firm also makes a specialty of glass furniture.

A PLASTIC MASS, which is valuable for many purposes, is made under a recent German patent, by well mixing, in equal proportions, ground calcined and paste magnetite, and a solution of sulphate of magnesia of 1.9 specific gravity, and running the mixture into oiled molds. The mass can be washed with warm soap and water, when hardened and will have the appearance of white marble, the hardness of which it also acquires with time. This new substance is called "marmorin."

COVERING FABRICS WITH A FILM OF TIN.—A recent French process consists in permeating fabrics with a solution of tin. A mixture of zinc powder and dissolved albumen is first made, and spread over the fabric with a brush, and, after drying, the stuff is passed first through superheated steam, then through a solution of chloride tin. In this way an exceedingly thin layer of tin is spread over the whole side of the fabric, which is thus rendered waterproof, and protected against ordinary rough usage.

GOOD HEALTH.

Hints on Sleep.

The question of chief importance to most people in these overwrought, wakeful days and nights is how to get good sleep enough. Dr. Corning drops a few simple hints which may be of value. In the first place, people should have a regular time for going to sleep, and it should be as soon as can well be after sunset. People who sleep at any time, according to convenience, get less benefit from their sleep than others; getting sleep becomes more difficult; there is a tendeney to nervous excitability and derangement; the repair of the system does not equal the waste. The more finely organized people are, the greater the difficulty and the danger from this cause. The first thing in order to sleep well is to go to bed at a regular hour, and make it as early as possible. The next thing is to exclude all worry and exciting subjects of thought from the mind some time before retiring. The body and mind must be let down from the high-pressure strain before going to bed, so that nature can assert her rightful supremacy afterward. Another point is, never to thwart the drowsy impulse when it comes at the regular time by special efforts to keep awake, for this drowsiness is the advance guard of healtby, restorative sleep.

Sleep is a boon which must not be tampered with and put off, for if compelled to wait, it is never so perfect and restful as if taken its own natural time and way. The right side is the best to sleep on, except in special cases of disease, and the position should be nearly horizontal. Finally, the evening meal should be composed of food most easily digested and assimilated, so that the stomach will have little hard work to do. A heavy, rich dinner taken in the evening is one of the things that murder sleep. Late suppers with exciting foods and stimulating drinks make really restorative sleep next to impossible. Narcotics are to be avoided, save as used in cases of disease by competent physicians. The proper time, according to Dr. Corning, to treat sleeplessness is in the daytime, and it must be treated by a wise and temperate method of living rather than by medicines. This is good common sense, says the New York *Star*, from which paper we copy, and doubtless a vast deal of the debility, nervous derangement, and the insanity of our time would be prevented by more good, restful, natural sleep.

MOSQUITO OIL.—The following is a very good mixture for anointing the face and hands while fishing: Oil of tar, 1 oz.; olive oil, 1 oz; oil of pennyroyal, ½ oz.; spirit of camphor, ½ oz.; glycerine, ½ oz.; carbolic acid, 2 drachms. Mix, and shake well before using.

The Evil Effects of Tobacco.

Many years ago Dr. Wm. A. Alcott published a very valuable little work on the "Physical, Intellectual and Moral Effects of Tobacco on the Human System." That work has since been revised, with notes and additions, by Nelson Sizer, and published by Fowler & Wells, of 753 Broadway, New York. In the new addition Mr. Sizer has added a sufficient amount of matter to nearly double the size of the book, and has brought the information and the facts bearing on the subject down to the present time. It shows the effects of the tobacco on the teeth, on the voice, and on the special senses; also its effect on the appetite and digestion, and how it leads to various diseases; its effect on the intellect and morals, and points out who are suffering most from its use. The slavery to tobacco is discussed in an extended and interesting account, giving the history and confessions of a tobacco chewer, and showing how he gave up the habit. An interesting history of a smoker is given, showing the great benefits he derived from quitting its use. This work should be in the hands of those who wish to have presented a feasible way of overcoming the habit, as it is shown that the greatest slave of tobacco may learn how to give it up without much difficulty, or the feeling of nervous loss, and so become thoroughly restored to self-mastership and health; and especially should it be placed in the hands of the boys, and of moderate smokers who have not yet fully acquired the habit. Its arguments are convincing, and we know of no better use that can be made of 25 cents than to send it to the publishers of this little book, and on receipt of the amount in postage stamps they will send it to any address by mail, post paid.

HOW TO REMOVE BLACK WORMS FROM THE FACE.—A contemporary says: The black points, flesh worms, or comedones, which are found in the face, and especially near the nostrils, are not at all produced by the accumulation of the particles of dirt or dust, as has generally been believed, but by pigmentary matter, which is soluble in acids. The following treatment bas been recommended: kaoline, four parts; glycerine, three parts; acetic acid, two parts, with or without the addition of a small quantity of some ethereal oil. With this pomade cover the parts affected in the evening, and if need be, during the day. After several days all the comedones can be easily expressed; most of them even come out by washing the parts with pumice stone soap. The same results can be obtained by bandaging the parts affected for a long time with vinegar, lemon juice, or diluted hydrochloric acid. The acids act like cosmetics, as they transform the black color into a brown and yellow shade, and destroy it gradually altogether.

POISON IN POTATOES.—No person should buy their potatoes of grocerymen who let them stand in front of their stores in the sun. Potatoes belonging to the "Solanum" family, of which the deadly night shade is one of its full brothers. All branches of the family contain more or less of that poisonous nareotic, called "solanine." The bulb, or potato, contains the least of this, unless they are exposed to the sun, which rapidly develops this element. Long exposure to the light, without the direct sun, will develop the solanine in the potato, and make an article unfit for food. But exposure to the sun is so injurious to the potato, making it not only unpalatable, but actually injurious to health, that any grocer for the offence of selling potatoes which have been exposed two or three days to the sun ought to be indicted for selling unhealthy and dangerous human food.—*Albany Journal.*

CHLOROFORMING THROUGH KEYHOLES, ETC.—We read now and then of cases in which burglars are supposed to have rendered their victims unconscious by holding cloths wet with chloroform to keyholes before entering an apartment. Of course the absurdity of such a fiction is sufficiently apparent. Whether sleepers can be made to pass from natural to chloroform sleep, if the chloroform is held near to the face, is still a question. Sometimes the experiment has succeeded, but in five experiments recently made to determine the fact, every one of the sleepers experimented upon woke at the expiration of three minutes, before they had come under the influence of the drug.

PREVENTION OF BOILS.—A St. Petersburg physician, Dr. Sieven, commends a very simple treatment for the prevention of this very painful form of abscess. He claims that if the skin be superficially scraped with a knife, so that a drop or two of blood may be pressed through the epidermis as soon as the peculiar stabbing or pricking sensation and slight induration announce the commencement of the boil, it will not be further developed.

CORN AND WART CURE.—Gezou's remedy for corns and warts is prepared as follows: Acid salicylic, 30 grains; extract cannabis indic, 10 grains; collodion, one-half ounce M. A correspondent of the *British Medical Journal* states that he has found the application of a strong solution of chromic acid, applied three or four times a day with a camel's hair pencil, to be the most easy and efficient way of removing warts. They soon become black and fall off.

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SAN FRANCISCO:
Saturday Morning, June 7, 1883.

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St. Mary's Hall—Rev. L. D. Mansfield, Benicia, Cal.
Mining Engineer—B. Salazar, San Francisco.

Passing Events.

This has been rather an "off" week. The national holiday coming in the middle of it has caused a cessation of business, many persons taking a three days' holiday. News from the mines is somewhat meager, also.

More attention seems to be paid just now to the Idaho and Montana mining regions than anywhere else. Many immigrants are coming into those territories, and no doubt hundreds of new mines will be opened this summer. Oregon and Washington are also attracting many, but that population is more of an agricultural one. Southwestern Nevada is being opened up in a rational manner now, and the extension of railroad facilities is developing a wide region. Part of this State is greatly benefited also. In Storey county, the great mining center, prospecting operations are going on, but no developments of importance have been made. Utah is at present, in bullion production, doing very good work.

IT is stated in a Montana paper that some excellent prospects are found in the country bordering the Yellowstone river. At the head of Emigrant gulch, one of the richest auriferous gulches worked in the country, several claims have been located. The Great Eastern is the name of a mammoth vein, 100 feet between the walls, with a fourteen foot pay streak. The owners are about to begin taking out ore and can keep an 80-ton smelter busy with a small force of men.

A New Industry.

Metallurgy of Nickel.

Mr. George J. Rockwell, of this city, has recently made the first bar of nickel ever produced on the Pacific Coast directly from the ore by one single process. The ore worked was of low grade (4½ per cent of nickel) but the process employed showed that ore of this quality could be worked practically and economically on a large scale. Mr. Rockwell has applied for a patent on his process, and is now engaged in prosecuting his experiments so as to include other ores of nickel.

Nickel occurs in the form of sulphides, arsenides, arseno-sulphides, antimono-sulphides, a sulphate, carbonate, silicates, arsenate; it also occurs in meteorites. These compounds are of various colors, namely: brass-yellow, tin-white, steel-gray, pale copper-red, rose color, apple-green; the latter color often confounding the mineral with copper carbonate. The following blowpipe test will serve to isolate nickel from other metallic oxides.

Blowpipe Test for Nickel.

Roast a quantity of the pulverized ore thoroughly on charcoal in the oxidizing flame to remove any sulphur, arsenic or antimony that may be present.

Dissolve a very small quantity of this roasted ore in a borax bead on a loop of platinum wire in the oxidizing flame and observe the color produced; oxide of nickel alone, in the absence of other metallic oxides, colors the glass reddish-brown. Saturate the bead with the roasted ore and shake it off into a small dish. Treat this bead on charcoal with a small piece of silver or gold, in a strong, reducing (yellow) flame. Lead may be used instead. Iron, manganese, cobalt, etc., remain in the bead, while nickel, copper, etc., are reduced and collected by the silver or gold button. Remove the button from the bead by breaking the latter on an anvil between paper. Treat the button on charcoal in the oxidizing flame with a salt of phosphorus (phosphate of soda and ammonia) bead, removing it while the bead is hot.

If nickel and copper are present, the bead will be green when cold; if nickel only, yellow; if copper only, blue.

Pacific Coast Nickel.

Nickel has recently been found in several places on this coast. In Oregon there is a large deposit of silicate of magnesia and nickel, technically known as Garnierite; this ore, which will not average more than five per cent. of nickel, nevertheless carries more than some which are worked profitably. Very large and valuable deposits of this metal, also, occur in several localities in Nevada. One of these deposits which is being rapidly developed promises to be the principal mine of nickel on this coast; the ore averages 20% and several tons have been sent to Europe and realized a handsoms profit over all expenses. It is expected that Mr. Rockwell's improvement will make it possible to reduce this ore at home and thus avoid the duty of 15 cents per lb. on the imported metal.

Nevada, which has already showered into our laps her millions of silver, will now add a new source of wealth to this coast.

The annual consumption of nickel in 1879 was about 600 tons, but the recent discovery of Dr. Fleitmann of Germany, who has succeeded in rendering it malleable will introduce it for many purposes hitherto impracticable owing to its brittleness.

Blunders in Mining.

Some of the old mining errors are still being committed. People occasionally now build quartz mills before they are sure of having a mine. Then also they begin working their ore when they try a mine with some new, untried process, and try to develop a mine and process both at once. One is generally enough for ordinary people to attend to. A common blunder is to judge a mine by a rich specimen. The existence of rich specimens is not proof of the high value of a mine. Among experienced miners this excites distrust. As a general proposition, pocket lodes are not very profitable, though sometimes of course they yield large amounts. Sinking deep shafts when nothing is found of value on the surface is in gold mining very risky. Crushing a lot of rock without selection or proper consideration of its value is a common blunder too; as is also failure to make assays of the tailings to see what is passing off.

Trying to run a mine by letter and not by personal presence is pretty often a losing operation. The business requires the supervision of competent men, but when competent men are found they should not be hampered. Absentees can never judge so well as those persons right on the ground.

Perhaps the most frequent error and that which has led many times to disastrous results is in supposing any one can run a mine. Because a man has money enough to buy a mine, or luck enough to find one, it by no means follows that he can manage it properly. Nor is it a reason when a rich man owns a lot of stock that a lot of his relations can run a mine better than old miners. Sending out inexperienced men from the East, putting in storekeepers, sailors, salesmen, drummers, etc., as resident managers; and trusting the ignorance of those they knew rather than the knowledge of those they did not know, has brought many a mining investor to grief.

When one sees these old blunders being repeated again and again, he thinks it strange inexperienced people don't employ proper persons to inform them what to do, rather than squander money, gaining experience on subjects already well understood by thousands.

New Wet Ore Separator.

Miles B. Dodge, of this city, has just received through the MINING and SCIENTIFIC PRESS Patent Agency a patent for an improved separator for wet ores. The apparatus is intended for the concentration of valuable metals and sulphurets from the gangue. The invention consists in the construction and arrangement of a conical water pan, a centrally placed cylinder and piston, a surrounding screen to receive the ore, and novel feeding and distributing devices, all operated by connected mechanism.

The apparatus in general consists of a conical pan or receptacle having a cylinder supported centrally and above the bottom, and around this cylinder a horizontal screen extending across the top of the pan with flanges or rims extending a short distance above it. Within the cylinder a plunger moves vertically, being operated by suitable mechanism, and water is admitted into the pan from below, filling it, so that the sudden downward movement of the plunger will force the water up through the screen and lift the body of ore upon it, so that the heavier, valuable portions will settle through the screen while the lighter material will be kept at the top and will run off over the outer rim when it has reached a sufficient hight, being assisted by revolving plows or scrapers which travel just inside the rim. The material is fed into a hopper surrounding the central shaft, having holes in the bottom which discharge upon a conical distributor, at the bottom of which are openings to allow the material to pass through upon the screen as the distributer revolves.

The operation is as follows: The screen bed being properly supplied with ore, and water being admitted into the pan through the supply pipe until it is full, the machine is set in motion, when the pistou will be lifted by inclined teeth, or cams upon suitable disks, and will be forced suddenly downward by a spring as often as it is raised and released from the cam, thus forcing the water up through the screen among the ore on the surface. The effect of this intermittent rush of water up through the screen is to cause the lighter portions to rise to the top and eventually to flow over the outer rim into the waste chute, and through it to any desired point of discharge. The heavier particles will settle upon and through the screen into the water in the pan, and flowing down its sides will escape through the discharge opening. Plows or scrapers on the arms of the distributing cone assist in discharging the waste material over the outer edge of the screen. The stroke of the piston may be regulated.

A GOVERNOR AS A MINER.—The Eureka *Sentinel* says: Last November Governor Adams purchased at auction, for a song, the personal property of the old Lemmon mill. When he was here, recently, he made arrangements with "Scotty," the well-known teamster, to haul it to Reveille, to his Gila mill. Yesterday 31,450 pounds of the freight were loaded up, and Heyworth started with a part of it, and "Scotty" follows with the rest of it to-day. The Governor has several thousand tons of tailings from the Gila mine, which will go over $30 per ton. The freight is composed of a White furnace, which will be put up at the mill for the purpose of roasting the tailings.

Lead Smelting.

For easily smelted ores, carrying a high percentage of lead, the Belgian smelting process is a good one. The furnaces greatly resemble the Flintshire, except the Belgian has two fireplaces—one at each end—and the hearth, instead of being concave as the Flintshire, slightly inclines at an angle, from both fire-places toward the center. The object of the two fireplaces is to economize fuel and afford a greater uniformity of temperature. The charge remains in the furnace 16 hours. Two workmen only are employed.

When the furnace is first charged, the temperature is kept for about half an hour at a red heat. At the end of this time the charge is worked, with short intermissions, for six hours, the temperature being raised toward the last to a cherry red heat. Molten lead now appears; the doors are closed and the temperature raised. In about four hours, during which time the ore is turned every half hour, lead ceases to flow, when powdered charcoal and lime are mixed with the charge to make it pasty and to reduce the oxides and sulphates which are formed. The charge is heated (being repeatedly worked) for about four hours longer, great care being taken that the temperature does not rise above a certain limit, lest other metals should also be reduced.

The dross is now subjected to an increased temperature for one-half to three-quarters of an hour, whereby it is agglomerated. It is then withdrawn from the furnace and smelted in a low-blast furnace, with slag from the smelting of the impure ores, dross from the lead refining furnace, and agglomerated fumes from the condensing chambers. The object in thus slowly roasting the ore, and conducting the reaction process by a low temperature, is manifold. With ore containing much copper and antimony, their reduction is avoided by the comparatively low temperature, and on the first reaction period the lead is not only purer, but holds most of the silver in the ore, and as the operation ceases when the lead in the dross reaches 60 per cent, the volatilization of lead is diminished. The loss of lead amounts to about five per cent. The amount of dross is great but the combined losses occurring both in the reverberatory, and the following smelting in a low-blast furnace is much smaller than it would be were the reduction originally carried on to greater extent in the reverberatory furnace.

Powder or Lime for Blasting.

We have several times noticed the experiments that are going on with relation to the use of lime for blasting in fiery coal mines. Not long since we gave a description of the way the process is carried out. Mining engineers in studying up the subject should not only consider the question of cost in coal mining, but also that of life-saving. It seems all the inquiry is as to cost alone; but the miners' lives should be considered as well. Still, as to cost, some comparative results are now obtainable with lime cartridges in place of wedging for twelve months at the Shipley collieries. It must be understood that in working the deep hard coal at these pits no shovels are allowed in the stalls, and only such of the small coal as can be picked up by the hand is sent to bank, the rest being thrown back into the gob. The quantity of coal produced per acre by the use of lime cartridges is seventeen per cent greater than from those stalls where wedging is still practiced. No comparision is made with the cost of powder, as no powder has been used here for twenty-five years.

In Belgium, the result of six months' work ing at "Hasard" collieries gives an increased percentage of large of from twenty to twenty-five per cent, and an increase selling price of from one and a half to two francs per ton after allowing one-half franc for additional labor in undercutting to prepare the coal better for the action of the lime cartridges.

There has been great delay in getting efficient machinery made for the factories which will shortly be erected in different parts of the kingdom. When these manufactories are in working order the large number of collieries now awaiting to adopt the system will be in a position to give more extended information.

GALENA, Idaho, has a good smelter, but the miners are anxious to sell their mines and indifferent about extracting the ores, and the smelter is standing still this summer for want of ore to smelt. Other localities are pursuing the same course.

Roasting and Chloridizing Furnace.

Robert A. Nevin, of this city, has a patent on an improved roasting and chloridizing furnace, designed to work low grade refractory ores of gold and silver quickly and cheaply with no waste of salt or loss of precious metals. The accompanying engravings show the form of furnace. Fig. 1 is a side elevation, and Fig. 2 a plan. In the accompanying drawings, *A B* represent the cylinders encircled by bearing-rings, *a*, which rest on friction-rolls, *C*, which are suitably journaled in boxes, *b*, that are fixed on a bed, *D*. Said cylinders, or furnaces, *A B*, are set at an inclination of an inch to the foot, or thereabout, and are designed to be revolved by means of worm and wheels, *E*, or other suitable device. The two furnaces, *A B*, are set at different elevations, the furnace, *A*, having its higher and receiving end revolving in a flue, *F*, that is connected directly with the smoke-stack, *G*, while its lower end revolves in the fire-box, *H*.

Extending laterally from the fire-box, *H*, is a flue, *I*, that extends parallel with the flue, *F*, for a short distance, and then turns at right angles and enters the smoke stack, *G*. The higher, or receiving end of the furnace or cylinder, *B*, revolves in the flue, *I*, on a lower plane than is the fire-box, *H*, and the lower end of said furnace, *B*, is supported in a fire-box, *K*, on friction-rolls, or other suitable device.

When the device is in operation the ore to be operated upon is fed into the higher end of the furnace A through a hopper, (indicated at *c*,) and passing through the furnace *A*, is exposed to a gradually-increasing temperature as it approaches the fire-box H, whereby the ore is wholly or partly desulphurized, the sulphurous fumes passing off at the same time through the flue F directly into the smokestack G. From the lower end of the furnace A the desulphurized ore falls through an inclined passage or chute, *d*, in the flue *I* into the higher end of the furnace B, and as the desulphurized ore passes through said passage or chute *d*, common salt is introduced through the hopper *f* to mix with the ore and fall with it into the furnace B. The mingled ore and salt then gradually descend through the furnace B, exposed to a gradually-increasing temperature as they approach the fire-box K, whereby the metallic portions of the ore are chloridized, until the ore finally falls into a receptacle, (indicated at *g*,) whence it may be removed for lixiviation or amalgamation. In this operation, the ore being wholly or partially desulphurized or oxidized before the application of the salt, the metallic portions of the ore and the chlorine of the salt more readily and thoroughly combine, thereby effecting a saving of salt and of the metals over the ordinary methods; and the passage of the ore from one furnace into the other being continuous the ore does not become cooled in the operation. It is well known, of course, that it is not new to first roast the ores by themselves and afterward with common salt. In this the two furnaces are combined and connected by a chute, and the salt is introduced into the ore in the passage of the latter from one furnace to the other.

One of these furnaces is running at the Nevajo-Independence mill, Tuscarora, Nev. It gives very good satisfaction. The superintendent says that the improvements made in the manner of desulphurizing and chloridizing have added four per cent to the working results, and a saving of 25 per cent in salt. The workings have averaged 94 per cent since this furnace was put in use. The shipments of bullion from the mill have been steady, showing results of the most satisfactory kind. They have shipped, since they begun working with this furnace, some $700,000; capacity of mill, 10 stamps.

The principle on which the Nevin patent ore-roasting and chloridizing furnace does the work so effectually and quickly is based on the old and approved method of oxidizing or desulphurizing before chloridizing.

There are two flues, a construction which admits of driving off the fumes while the ore is being desulphurized, but the chlorine of the salt is retained in the chloridizing furnace. Robert A. Nevin, patentee; box 2361, San Francisco, Cal., will issue licenses for use or sale; or will construct furnaces.

Two hydraulic miners, G. F. Jacobs and Michael O'Brien, coming into Nevada City from the Sargent & Jacobs' hydraulic claims, at Quaker Hill, were "stood up" by two masked highwaymen. The robbers took an iron pail containing $1,200 worth of wet amalgam, cleaned up that day from the head flumes of the Scott's flat set of diggings.

Mining Patents.

The Commissioner of the General Land Office a short time since rejected the application for patent of a California gravel mine, because in the necessary publication of the notice the tract was described as the east half of a certain section when it was really the south half. The initials S and E were used as is customary in such notices. The owners of the tract applied to the Secretary of the Interior, who rules that patents cannot properly issue unless the land applied for is specifically described in the publication, or with such certainty that persons in interest cannot be misled thereby. Publication as to the E. ½ of the tract in question was not publication as to the S. ½, and persons interested in the S. ½ were not required to take notice thereof. It is immaterial that, as claimed by appellants, this was a typographical error merely, because it was not, legally or in fact, publication of notice of the ten acres of land applied for.

The Secretary does not say, therefore, that the Commissioner's decision is erroneous, but he modifies that decision, and directs that if appellants shall so elect, they may, within sixty days, under direction of the Register, publish a supplemental notice of their application for patent for said S. ½, with the same rights thereunder, and the same rights to other parties, as if it were an original publication, provided the tract shall not then be otherwise appropriated, or valid adverse rights shall not have attached thereto; and if such right shall not have attached, the Commissioner is instructed to withhold the tract from other disposition pending the time allowed appellants for selection.

Working in Bad Air in Mines.

We have several times referred to the apparatus for working in bad air underground, which is being introduced in the various England collieries, where it is kept for use in case of accident. It is called the Fleuss apparatus. It is self-sustained and wholly independent of the surrounding atmosphere, and will supply breathable air for four hours at a time, thus enabling the wearer to breathe with safety in the most deadly gases. The principle of the apparatus is, that the wearer breathes his own breath over and over again, the carbonic acid being taken from it at each respiration and the requisite amount of oxygen restored, the revivified breath is fit to be again inhaled in the form of pure air. The apparatus, which is carried upon the back of the explorer, in the form of a knapsack, consists of a strong sheet copper cylinder, twelve inches by six and one-half inches, with domed ends, and capable of holding four cubic feet of oxygen gas, at a pressure of sixteen atmospheres. Above the cylinder and attached to the side of it is a square metal box, twelve by twelve by four inches, to contain the filter, which is a box of vulcanite divided into four compartments by vertical diaphragms, and with a wooden lid, made air-tight by an india-rubber washer, and having an inlet and outlet pipe with valves attached. This box is filled with hempen tow and stick caustic soda; the exhaled breath passes twice up and down through the tow and soda, and is thoroughly freed of carbonic acid, the excess of moisture collecting under a perforated false bottom arranged for that purpose. A flat bag of vulcanized india-rubber, 15 by 12 inches, is fastened in front of the wearer, and is connected by an india-rubber pipe passing over the shoulder to the outlet pipe of the filter: the bag is also in communication with the oxygen chamber, and the supply of oxygen can be regulated by a jamb screw valve under the control of the wearer. An india-rubber mask is made to fit airtight to the face and is held in place by straps buckled up at the back of the head. The mask is fitted with a pair of flexible pipes, the one for exaling being in communication with the inlet pipe of the filter, and the other for inhaling being in communication with the air bag. The exhaled breath having passed through the filter, enters the bag in a purified state, and there meeting with its complement of oxygen, is fit to be again inhaled. The bag, being perfectly flexible, readily expands or contracts as the breath passes in or out of it, so that no effort is required in respiration. Foster and Fleuss' safety mining lamp is a modification of the lime light, methylated spirits of wine being used instead of hydrogen gas, and consists of a strong copper sphere, seven inches in diameter, and capable of being charged with oxygen at a pressure of from sixteen to twenty atmospheres. To the top of the sphere is attached a small spirit lamp with two wicks, between which, through a small jet, a minute stream of oxygen, regulated by an adjusting valve on the sphere, is allowed to pass, carrying the flame against a cylinder of lime held on a stud placed to receive it. The light is covered in and rendered perfectly safe from inflammable gases by a double dome-shaped metal casing, having an annular space left between its inner and outer surfaces, which is filled with water. Discs of plain glass are inserted opposite each other in the inner and outer casings and a small outlet valve is fixed in the inner case near its lower part for the escape of the products of combustion from the inside of the casing into the annular space filled with water between the two cases, through which the gases bubble and escape through another outlet valve fixed on the top of the outer case. The cover is attached to the lower part by means of a screw, an airtight joint being made by a leather washer seating. The lamp will burn for four hours under water, in carbonic acid or in firedamp, and it cannot get hotter than boiling water. The essence of these inventions is, that all means of communication with the surface or pure atmosphere is now dispensed with, and the wearer of Fleuss' dress is enabled to carry with him, not merely compressed air, but more compactly, and therefore lasting for a longer period, the ingredients for producing and reproducing breathable air. The lamp also is isolated and self-contained, giving light that is inaccessible to the gases or water by which it may be surrounded without imparting or sustaining injury, and without any connection with tubing or electric wires.

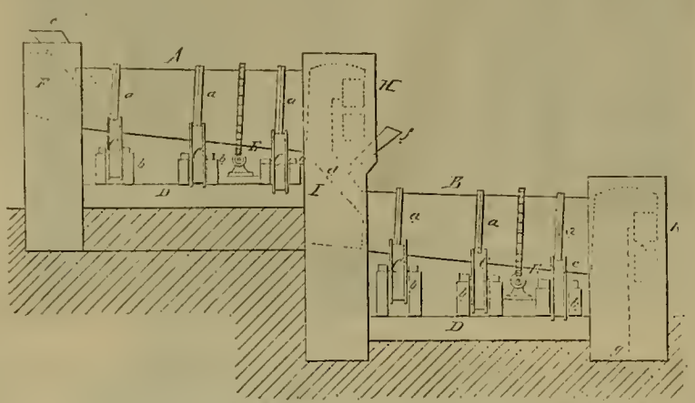


FIG. 1.—NEVIN'S ORE ROASTING AND CHLORIDIZING FURNACE.

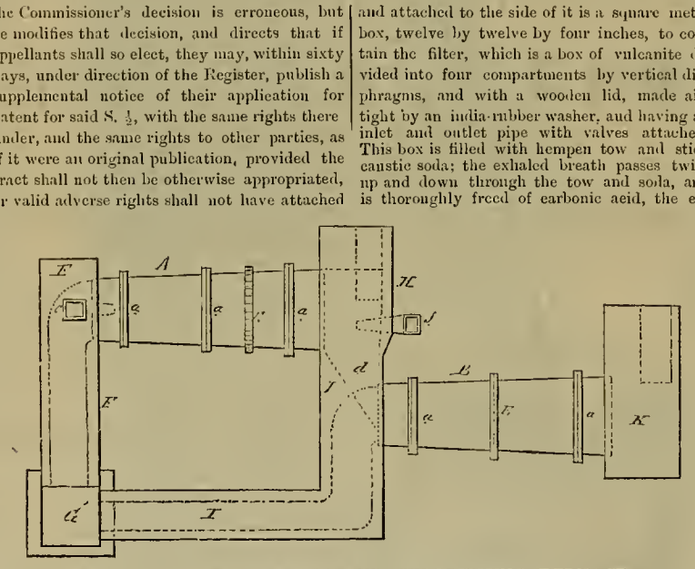


FIG. 2.—PLAN OF ROASTING AND CHLORIDIZING FURNACE.

Reduction Works.

The Mardoch reduction works, which are to be put in operation at Ogden this season by a company of Eastern capitalists, propose to combine with facilities for reducing the various kinds of ore, sampling works and the purchase of ores on a large scale. We hear of sampling works being contemplated at several other points where ore purchasers and miners will be accommodated, but sampling works and ore purchasers at Ogden will benefit only the few miners in this camp who have a sufficiently high grade of ore to warrant the expense of transportation to that point. Could the ore market be brought to our door by the establishment of the works here, not only would thousands of men be employed in the works and in extracting ores from lower grade mines, but the capital employed would be kept at home and the projectors of the enterprise could buy their ores at prices so reasonable as to insure a large return on the capital invested. —Butte *Miner*.

Enlarged Issues of the Mining and Scientific Press.

It is the intention of the publishers of this journal to spare no enterprise in advancing the future interests of its readers by all reasonable and practicable methods. Among other advances, we contemplate issuing soon several extra sized sheets, especially devoted to different important localities. The next will be on

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Other double editions will follow shortly after, which will be devoted to the special interests of other mining localities.

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Persons who can contribute information of special or general interest to our readers for these various issues are solicited to send the same as early as possible. If miners will send us descriptions of their mines or camps we shall be very glad to receive them.

As we make this extra effort to advance the interests of all concerned in the places named, we ask that all who can, to favor our enterprise by making the matters more widely known, and the MINING AND SCIENTIFIC PRESS more extensively patronized. The mining literature of the world is comparatively limited. Miners and scientific men especially should be liberal to assist their helpers in a line of publication, which, at best, cannot be expected to be largely profitable while doing strict justice to the highest interests it represents.

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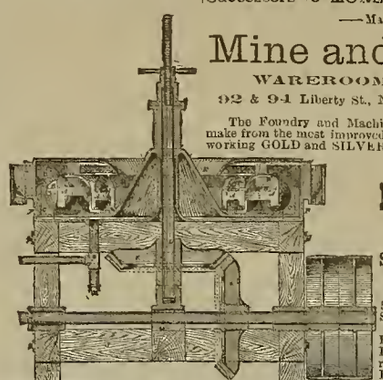
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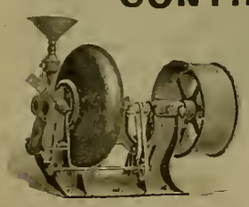
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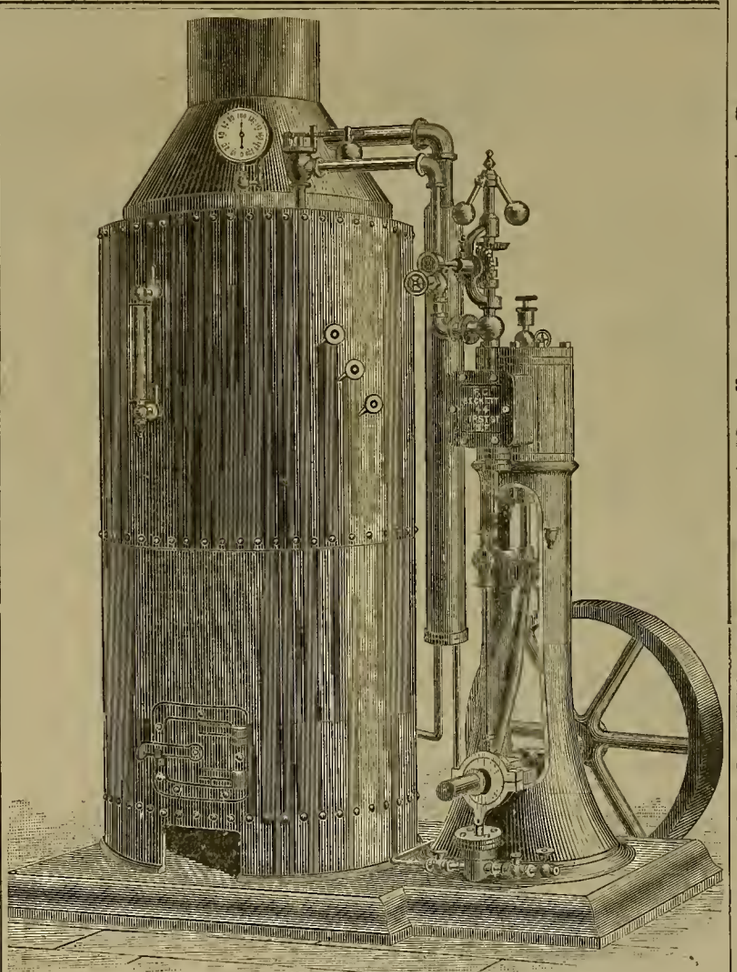
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Improved Hoisting Engines, Engines for steam Yachts, Engines for pumping artesian wells and irrigating and farming purposes, and all kinds of Machinery.

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STEAM CYLINDER AND MACHINE OILS,
The Best and Cheapest.

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This is the only Scientifically Constructed Bucket in the market. It is struck out from charcoal stamping iron. No corners to catch. No seams to burst. No interior corners to clog up. It runs with great ease, and half the power of the old style bucket. WILL OUTWEAR HALF A DOZEN OF THEM.

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Room with steam power to let in the Pacific Power Co.'s new brick building, Stevenson street, near Market. Elevator in building. Apply at the Company's office, 314 California street.

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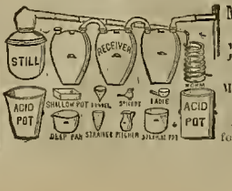
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Philadelphia Chemical Stoneware Manufactory,

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Manufacturer of all kinds of Chemical Stoneware
—FOR—
Manufacturing Chemists.
Also Chemical Bricks for Glover Tower.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING JUNE 26, 1883.

280,013.—FOLDING BOX—P. Canessa, S. F.

280,135.—DRAFT EQUALIZER—E. H. Cooper, Winters, Cal.

280,161.—VEGETABLE SLICER—F. Espel, S. F.

280,026.—SPOON BORING BIT—Benj. Forstner, Salem, Or.

280,027.—ROTARY ENGINE—C. C. Garcelon and W. A. Woods, Santa Cruz, Cal.

280,315.—HYDRAULIC JACK—T. O. Hutchinson, Salem, Or.

280,319.—BUCKLE—McCloskey & Coleman, Walla Walla, W. T.

280,057.—PICTURE BRACKET—Charles Megow, S. F.

280,234.—BOTTLE-FILLING MACHINE—William Pearson, Carson, Nev.

280,106.—FORCE PUMP—M. L. G. Wheeler, Oregon City, Or.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

SAW SWAGE.—Simon Kinney, of Port Townsend, W. T. No. 279,769. Dated June 19, 1883. This invention relates to a new and useful improvement in the class of saw swaging machines, and more especially in that certain machine previously patented by the same inventor. The improvement consists in a novel swaging die or block of peculiar but simple construction. It is of such a shape that it is practicable to make it of a single piece of steel. One side of it acts as a hack or guide to steady the side which is serving as a die, and it cannot rock or roll. It is strong, and has nothing to work loose. Its single guide arm is sufficient, as the pressure is all on the back; and it may be for this reason made less cumbersome than the old form.

New Smelters.

Operations at the smelters continue at a lively rate. One hundred men are now employed in constructing the new plants and running the old ones. Among important buildings recently completed is a large brick stack about fifty feet high and 8x8 at the bottom, which serves as a final outlet for the fumes, which are freed from lead by passage through a lengthy horizontal flue after leaving the furnaces.

One of the forty-ton furnaces was blown in on Wednesday evening, and the remaining one, which is now under preparation, will be ready by the 20th instant.

Ore hauling to the smelters continues at the rate of 50 tons daily. Seven large teams are making regular trips from the West Fork and Irwin mines, while two are hauling from the Elkhorn, two from the Star, one from Star Mountain, and several from East Fork, besides those engaged in hauling fluxes.

The 21 charcoal kilns are kept in operation by the wood from Warm Spring creek, which is floated down in large quantities in the V flume. It is estimated that 5,000 cords are ready for the flume. Everything looks lively at the works, and the new building improvements necessary for the managers and men, being nearly completed, add much to the general appearance of the place.—*Ketchum (Idaho) Keystone.*

A PROSPECTOR'S LUCK.—Sam. Schepp, a prospector, a short time since, went to an old citizen of Graniteville, this county, and asked for a pointer as to where he could go to work and make grub money. He was directed to the croppings of a ledge that crosses the wagon road between Graniteville and Morse's mill, and advised to try his luck there. He sunk down, took out 30 tons of ore and had it crushed, and realized $600. The quartz gets better as it goes down, and now the locator proposes to open his claim systematically. For 17 years Schepp had been picking around the county, but he managed to hit the wrong place every time till now. For a great many years a string of wagons have been traveling over the croppings of this rich ledge, and many a prospector has taken a look at it only to conclude that he could expend his labor somewhere else to better advantage. That's the way the wheel of fortune whizzes around in a mining county. You can't tell when it is going to stop at the right notch.—*Nevada Transcript.*

THE excess in the value of exports over imports for the twelve months ending May 31, 1883, is $99,334,649; total value of imports and merchandise for twelve months ending May 31, 1883, $731,068,482.

"ONE OF OUR MOST INTERESTING EXCHANGES," is the way the *Southern Planter*, of Richmond, Va., speaks of the RURAL PRESS.

Placers and Lode.

A very important decision has been rendered by a federal court in the case of the Iron Silver Mining Co. against Sullivan and the Champion Mining Company. The decision was based upon a number of new questions of law which have never before entered into any mining suit, and the result is that millions of dollars worth of mining property will be affected by it. It decides four different suits, three of which are against the Champion Company. They are all for ejectment. It is claimed that the defendants located lodes within the property patented as placer mines by the Iron Silver Mining Company. In their respective answers they held in general terms only that the lodes were "known" lodes and failed to show whether or not they had ever taken any silver from the lodes or had filed any claim previous to the location of the placer claims. A general demurrer was entered to their answers and the demurrer was sustained yesterday. The decision holds that the term "known lode" within a placer claim does not make the owner's title good unless he can show that he had filed a claim for the lode, which ante-dates the claim for the placer property.

Judge McCrary expressed a wish that the decision in this case, which affects numerous others, might be submitted at an early day to the consideration of the Supreme Court of the United States. He said he had found much difficulty in the construction of sections 2,320 and 2,333 of the Revised Statutes of the United States, the meaning of which is involved in these cases.

A New District.

The Rochester mining district, situated in Madison county, Montana, is just now attracting considerable attention, and the indications point to renewed activity in that section, during the present season. Not a few of the prospects there have been opened up very successfully, and the ore, in the majority of cases, is of excellent grade and exceptional milling quality. The veins crop distinctly and are parallel and continuous. The district has already produced several hundred thousand dollars in gold, but as no one had the enterprise or money to erect a custom mill of adequate capacity, to enable a number of mines to be worked at the same time, mining operations, until quite recently, have never been prosecuted in the district with much energy. Now, however, an awakening interest is felt in Rochester mines, and the fact that the ledges there are in the main gold-bearing, and the ore therefore of a character easy to realize upon, is quite certain to result in the inauguration of a number of important mining and milling enterprises. The latest evidence of this statement is the sale last week of a fourth interest in each of the three properties known as the Magna Charta, Garfield and True Fissure for the sum of $10,000 to Eastern parties represented by John Zurcher and Edward Wright, two solid and well known mining men. These interests were owned by Mr. M. G. Fitzgibbons, a practical and experienced miner, who is also interested in the Santa Maria and Colusa, which are rich and promising claims. Messrs. Larahie and Mellich, of Butte, are also extensively interested in Rochester, and the former, who is a capable mining engineer, speaks very highly of the prospects of the camp. Mr. Van Dusen, of Butte, also bought into a Rochester prospect a few days ago, and will leave to-night for the purpose of exploring his purchase. Before the end of next summer Rochester will rank among the best gold camps on the coast.—*Inter-Mountain.*

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $4 a year, in advance. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times,) by turning a leaf.

Successful Patent Solicitors.

As Dewey & Co. have been in the patent soliciting business on this coast now for so many years, the firm' name is a well-known one. Another reason for its popularity is that a great proportion of the Pacific coast patents issued by the Government have been procured through their agency. They are, therefore, well and thoroughly posted on the needs of the progressive industrial classes of this coast. They are the best posted firm on what has been done in all branches of industry, and are able to judge of what is new and patentable. In this they have a great advantage, which is of practical dollar and cent value to their clients. That is this understood and appreciated is evidenced by the number of patents issued through their SCIENTIFIC PRESS Patent Agency (S. F.) from week to week and year to year

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions The pavilion has new varieties of performances The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

News in Brief.

THE Chicago banks are following the lead of the New York ones, and are using every means possible to throw the trade dollar out of circulation.

THE strike of the Chinese laborers on the Oregon extension still continues, and the Mongolians are provided with three weeks' rations.

ADVICES indicate a general outbreak of smallpox among Arizona Indians, and Commissioner Price has ordered a supply of vaccine virus sent to the threatened points.

IT IS sagaciously noted that to determine the value of building stone a ramble among the tombs is wise. In far fewer years than most imagine monuments are in decay.

THE idea of a prominent European Sanitary Board for protection against epidemics and other diseases, is mooted by the press of Vienna. It is thought that the Austrian Government will officially propose the formation of such a Board.

A CAVE in or filling up of the great diamond mine of Kimberly, in Cape Colony, has caused much distress. The disaster has affected other mines, and ten leading diamond merchants have committed suicide on account of their financial troubles.

MACKEREL and sardines are being caught just now in large quantities off the wharf. If sardines or anchovies are so plentiful and olive oil so abundant here, why cannot the sardine packing business be successfully inaugurated here?—*Santa Barbara Press.*

THE action of the United States authorities and the general expression of the public opinion of America in relation to the influx of paupers from Ireland, have plunged some of the Irish Poor Law Guardians into the deepest alarm and perplexity, and have called forth in England a good deal of sharp criticism.

THE cholera has almost closed Port Said to commerce. The loss and delay consequent upon a lengthy quarantine keep vessels from taking coal and water there. The French fleet is preparing to leave, and transfers of merchandise are refused unless they have been subject to quarantine.

THE production of rails of various descriptions in the United States last year was as follows: Bessemer steel, 1,438,155 tons; iron, 227,874 tons; open hearth steel, 22,765 tons; total, 1,688,794 tons. The corresponding production in 1882 was as follows: Bessemer steel, 1,330,302 tons; iron, 488,581 tons; open hearth steel, 25 217 tons; total, 1,844,100.

THE Philadelphia Smelting Works at Ketchum, Idaho, cover several acres of ground. One hundred tons of ore are delivered daily, all of which is paid for at an average of at least $50 per ton. This gives employment not only to the miners who extract the ore, but to all the business men and citizens of the place, in one form or other, either directly or indirectly. It is said that fifty teams are employed in hauling ore, lime, coke, iron ore and other supplies to these smelting works. While other localities are holding their mines for sale and refuse to take out the ores, under a pretense that they cannot sell or ship them on a paying basis, fifty mines are being worked in this section, and they are selling the ores to the Philadelphia company at remunerative prices.

CONSTIPATION, liver and kidney diseases are cured by Brown's Iron Bitters, which enriches the blood, and strengthens the whole system.

B. SALAZAR,

Mining Engineer and Metallurgist.

Graduate of Freiberg and Clausthal Royal Mining Schools, Germany.

WILL FURNISH ACCURATE REPORTS ON MINES in the United States and Mexico. Also, act as

CONSULTING ENGINEER

To Companies on all METALLURGICAL and MINING MATTERS.

Starting up Tunnels, Smelting or Leaching Works a Specialty.

Several years' Practical Experience in Arizona and Mexico. Would take charge of a mine or reduction works.

TEMPORARY OFFICE with Kustel & Co., 318 Pine St., San Francisco, Cal.

DIVIDEND NOTICE.

The German Savings and Loan Society.

For the half year ending June 30, 1883, the Board of Directors of the GERMAN SAVINGS AND LOAN SOCIETY has declared a dividend on Term Deposits at the rate of four and thirty-two one-hundredths (4 32-100) per cent per annum, and on Ordinary Deposits at the rate of three and six-tenths (3 6-10) per cent per annum, free from Federal Taxes, and payable on and after the 2d day of July, 1883. By order,

GEO. LETTE, Secretary.

DIVIDEND NOTICE.

San Francisco Savings Union

532 California Street, Corner Webb.

For the half year ending with June 30, 1883, a dividend has been declared at the rate of four and thirty-two one-hundredths (4 32-100) per cent per annum on Term Deposits, and three and sixty one-hundredths (3 60-100) per cent per annum on Ordinary Deposits, free of taxes, payable on and after THURSDAY, 12th July, 1883.

LOVELL WHITE, Cashier.

PLAIN TRUTHS

The blood is the foundation of life, it circulates through every part of the body, and unless it is pure and rich, good health is impossible. If disease has entered the system the *only* sure and quick way to drive it out is to purify and enrich the blood.

These simple facts are well known, and the highest medical authorities agree that *nothing* but iron will restore the blood to its natural condition; and also that all the iron preparations hitherto made blacken the teeth, cause headache, and are otherwise injurious.

BROWN'S IRON BITTERS will thoroughly and quickly assimilate with the blood, purifying and strengthening it, and thus drive disease from any part of the system, and it will *not* blacken the teeth, cause headache or constipation, and is positively *not* injurious.

Saved his Child.

17 N. Eutaw St., Baltimore, Md. Feb. 12, 1880.

Gents:—Upon the recommendation of a friend I tried BROWN'S IRON BITTERS as a tonic and restorative for my daughter, whom I was thoroughly convinced was wasting away with Consumption. Having lost three daughters by the terrible disease, under the care of eminent physicians, I was loth to believe that anything could arrest the progress of the disease, but, to my great surprise, before my daughter had taken one bottle of BROWN'S IRON BITTERS, she began to mend and now is quite restored to former health. A fifth daughter began to show signs of Consumption, and when the physician was consulted he quickly said "Tonics were required;" and when informed that the elder sister was taking BROWN'S IRON BITTERS, responded "that is a good tonic, take it."

ADORAM PHELPS.

BROWN'S IRON BITTERS effectually cures Dyspepsia, Indigestion and Weakness, and renders the greatest relief and benefit to persons suffering from such wasting diseases as Consumption, Kidney Complaints, etc.

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Submarine Monitor

COMPANY,

230 Montgomery Street, Room 20,

SAN FRANCISCO.

WM. H. MILLIKEN, Engineer.

☞ Plans are on exhibition and stock ready for issue. Any information that is desired can be furnished at the office as above.



Is the Best Pump in the World. Another New Improvement is Lewis' Patent Spray Attachment.

Can change from solid stream to spray instantly. Regular retail price, $6. Weight, 4½ lbs. Length, 32 inches.

FOR SALE BY JOHN H. WHEELER, 111 Leidesdorff St., S. F.

P. S.—A sample can be seen at this office.

LAND Good land that will raise a crop every year. Over 12,000 acres for sale in lots to suit. Very desirable Fruit, Vine, Grain, Vegetable, Hay, and Pasture Land. Near Railroad and Sacramento river; $3 to $30 per acre. Wood and water convenient. U. S. Title perfect. Send stamp for illustrated circular, to EDWARD FRISBIE, Proprietor of Reading Ranch, Anderson, Shasta Co., Cal.

REMITTANCES to this office should be made by postal order or registered letter, when practicable. Cost of postal order, for $15 or less, 10 cts.; for registered letter, in addition to regular postage (at 3 cts. per half ounce), 10 cts.

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BENICIA, CAL.

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TUESDAY.....JULY 31, 1883,

At 2 o'clock.

RT. REV. J. H. D. WINGFIELD, D. D., LL. D., President.

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Home School for Young Ladies and Children.

The Twentieth Annual Session will commence Thursday, August 2, 1883.

This Institution offers to a limited number advantages of the highest order, having a large corps of well-known teachers who give individual care and treatment to each pupil. Address MRS. L. MANSON-BUCKMASTER, San Mateo, Cal.

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1036 Va'enc a St., San Francisco.

The building has been enlarged and re fitted. The next session will commence July 23d. For catalogue, address

REV. EDWARD B. CHURCH, A. M., Principal.

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—FOR—

YOUNG LADIES,

1825 Telegraph Avenue, Oakland, Cal.

Organized in 1872.

The next Year begins on WEDNESDAY, JULY 25, 1883

MISS L. A. FIELD, Principal.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time they intend to pay for it*, let them not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent,

Mining Companies.

Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

Seaton Gold Mining Company.—Location

of principal place of business, San Francisco, California. Location of works, Daytown, Amador county, California. NOTICE.—There are delinquent upon the following described stock, on account of Assessment No. 2, levied April 10, 1883, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Scott, L. A	4	10	$ 75
Warner, Alex	5	10	75
Martin, A, Trustee	6	5,000	375 00
Martin, A, Trustee	7	5,000	375 00
Martin, A, Trustee	8	5,000	375 00
Martin, A, Trustee	9	5,000	375 00
Martin, A, Trustee	10	1,000	75 00
Martin, A, Trustee	11	1,000	75 00
Martin, A, Trustee	12	1,000	75 00
Martin, A, Trustee	13	1,000	75 00
Martin, A, Trustee	14	1,000	75 00
Martin, A, Trustee	15	1,000	75 00
Martin, A, Trustee	16	1,000	75 00
Martin, A, Trustee	17	1,000	75 00
Martin, A, Trustee	18	1,000	75 00
Martin, A, Trustee	19	1,000	75 00
Martin, A, Trustee	20	500	37 50
Martin, A, Trustee	21	500	37 50
Martin, A, Trustee	22	500	37 50
Martin, A, Trustee	23	500	37 50
Martin, A, Trustee	24	500	37 50
Martin, A, Trustee	25	500	37 50
Martin, A, Trustee	26	500	37 50
Martin, A, Trustee	27	500	37 50
Martin, A, Trustee	28	500	37 50
Martin, A, Trustee	29	500	37 50
Martin, A, Trustee	30	4,000	300 00
Martin, A, Trustee	31	900	67 50
Davis, John A	32	90	6 75
Martin, A, Trustee	33	5,000	375 00
Martin, A, Trustee	34	5,000	375 00
Martin, A, Trustee	35	5,000	375 00
Martin, A, Trustee	36	4,900	367 50
Kellogg, C W	37	100	7 50
Martin, A, Trustee	38	5,000	375 00
Martin, A, Trustee	39	5,000	375 00
Martin, A, Trustee	40	5,000	375 00
Martin, A, Trustee	41	5,000	375 00
Martin, A, Trustee	42	5,000	375 00
Martin, A, Trustee	43	10,000	750 00
Fischer, Bertha C	45	100	7 50
Cornwall, P B	46	4,800	360 75

And in accordance with law and an order of the Board of Directors, made on the 10th day of April, 1883, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at 528 California St., Room 6, San Francisco, Cal., on TUESDAY, the 5th day of June, 1883, at the hour of 1 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

A. MARTIN, Secretary.

OFFICE—Room 6, 528 California St., San Francisco, California.

POSTPONEMENT.

The above sale of delinquent stock is hereby postponed to THURSDAY, the 28th day of June, 1883, at 1 o'clock P. M., at the same place. By order of the Board of Directors. A. MARTIN, Secretary.

San Francisco, June 6, 1883.

The above sale of delinquent stock is hereby postponed to THURSDAY, July 26, 1883, at 1 o'clock P. M., at the same place. By order of the Board of Directors.

A. MARTIN, Secretary.

San Francisco, June 28, 1883.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company.

San Francisco, July 2, 1883.

At a meeting of the Board of Directors of the above named company held this day, Dividend No. 56, of twenty-five cents (25c.) per share, was declared, payable THURSDAY, July 12, 1883, at the Farmers' Loan and Trust Company, in New York, or at the office in this city.

WILLIAM WILLIS, Secretary.

OFFICE—Room No. 29, Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Bulwer Consolidated Mining Company

San Francisco, June 21, 1883.

At a meeting of the Board of Directors of the above named company, held this day, Dividend No. 18, of fifteen cents (15c.) per share, was declared, payable on Monday, July 2, 1883. Transfer books closed on Saturday, June 23, 1883, at 12 o'clock M. This dividend is payable at the Farmers' Loan and Trust Company in New York, on all stock issued there, and at the office in this city on all stock issued here. WM. WILLIS, Secretary.

OFFICE—Room 29, Nevada Block, No. 309 Montgomery Street, San Francisco, Cal.

ASSESSMENT NOTICE.

Gould and Curry Silver Mining Company.

ASSESSMENT No. 45.

Levied	June 15, 1883
Delinquent	July 20, 1883
Day of Sale	August 13, 1883
Amount	FIFTY cents per share.

ALFRED K. DURBROW, Secretary.

OFFICE—Room No. 60, Nevada Block, No. 309 Montgomery Street, San Francisco, Cal.

Inventors L. PETERSON MODEL MAKER.

258 Market St., N. E. cor. Front, up-stairs, San Francisco Experimental machinery and all kinds of models, tin, copper and brass work

THE CALIFORNIA POWDER WORKS.

MANUFACTURERS OF

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HERCULES POWDER

HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in use, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fumes, notwithstanding bombastic and pretentious claims by others.

It derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.

No. 1 (XX) is the Strongest Explosive Known.

No. 2 is superior to anv powder of that grade.

PATENTED IN THE UNITED STATES PATENT OFFICE.

ORDERS RECEIVED FOR HERCULES CAPS AND FUSE.

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Joseph Roylance. Robert Dalziel. William Moller.



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BRASS WORKS!

Manufacturers of all kinds of

Brass Goods for Plumbers,

GAS AND STEAM FITTERS,

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Iron Pipe and Plumbers' Materials,

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William Hawkins.

(SUCCESSOR TO HAWKINS & CANTRELL).

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210 and 212 Beale Street, bet. Howard and Folsom Sts., - - San Francisco.

Manufacturer of

IMPROVED PORTABLE HOISTING ENGINES.

FOR MINING AND OTHER PURPOSES.

Also of the HAWKINS' PATENT ELEVATOR HOIST, for Hotels, Warehouses and Public Buildings.

Steam Engines and all Kinds of Mill and Mining Machinery.

Pacific Rolling Mill Co.,

SAN FRANCISCO, CAL.

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ROLLED BEAMS, ANGLE, CHANNEL AND T IRON, BRIDGE AND MACHINE BOLTS, LAG SCREWS, NUTS WASHERS, ETC., STEAMBOAT SHAFTS, CRANKS, PISTONS, CONNECTING RODS, ETC., ETC.

Car and Locomotive Axles and Frames, and Hammered Iron of Every Description.

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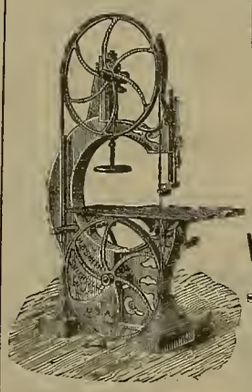
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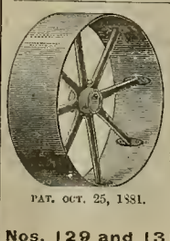
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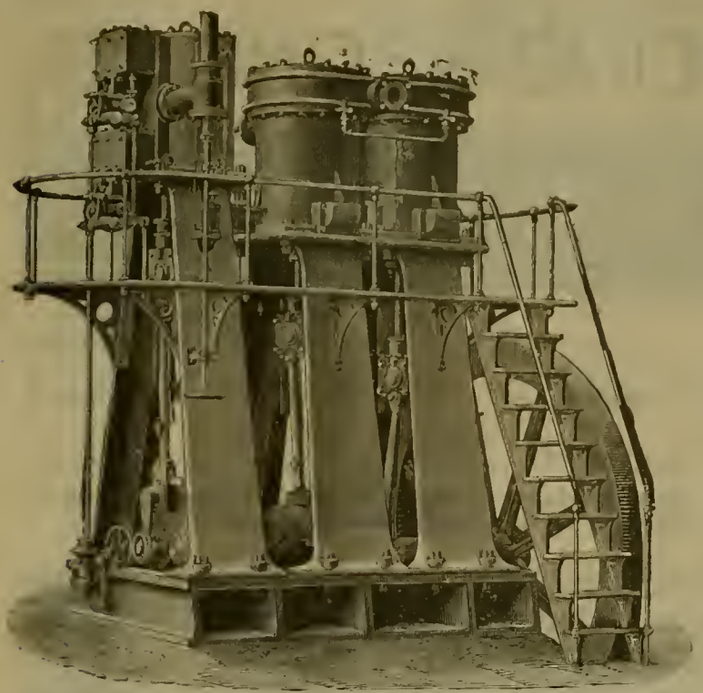
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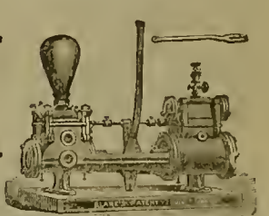


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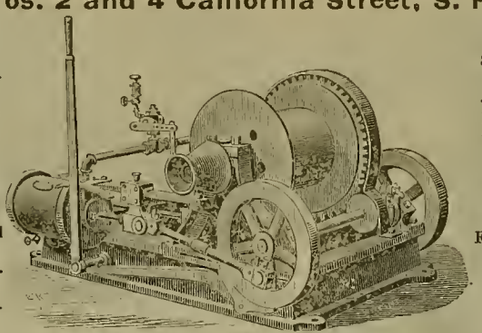


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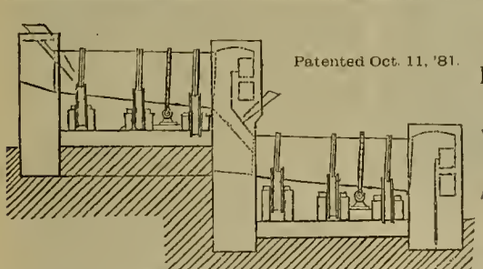


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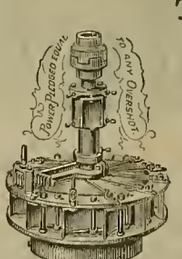
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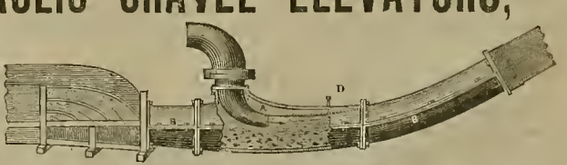
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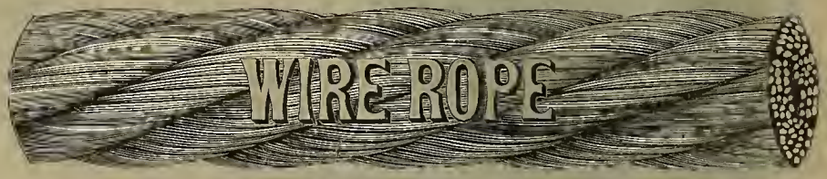
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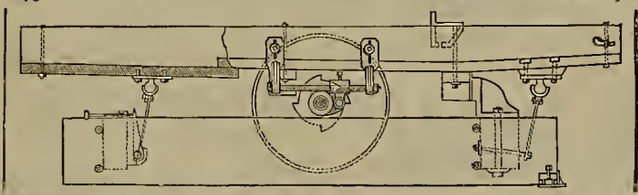
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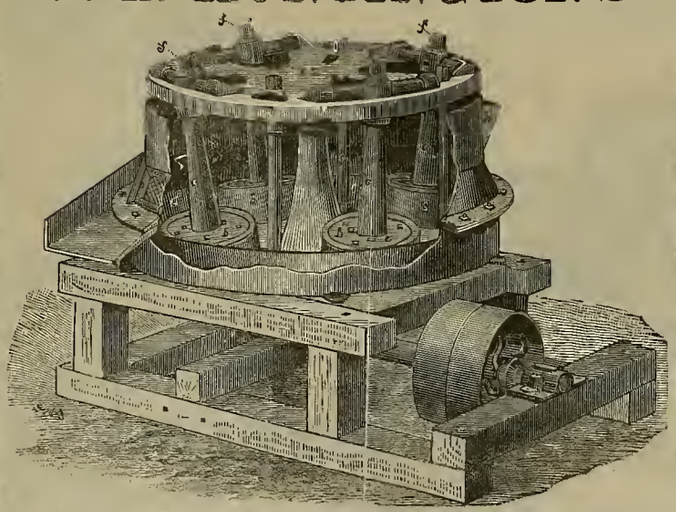
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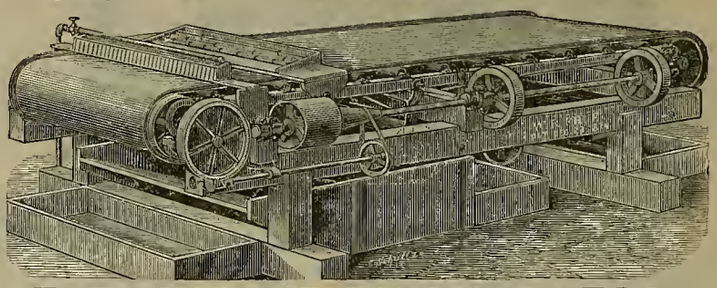
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That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.

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That if there are those who for any reason prefer an end-shake machine, we can manufacture and sell to such a machine of that description, as efficient as the Triumph, and at a lower price, and no liability for infringement will then be incurred by the purchaser.

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Nov. 6, 1882.

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SAN FRANCISCO, SATURDAY, JULY 14, 1883.

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Stampedes and Stock Gambling.

To these methods most often have the more avaricious and mobile of our population had recourse, when seeking to acquire sudden wealth or recuperate their waning fortunes. At first, and so long as the business of gold mining exclusively obtained, this propensity found expression in the old-fashioned stampede, which, though it led to some loss and hardship, was comparatively harmless, the stampeder losing not much besides his time, and others only such small sums as had been expended in "out-fitting" the adventurer.

With the discovery of the Comstock lode and the outgrowth of that event, the establishment of Stock Boards, there was inaugurated the practice of dealing in mining shares, which, however it may have made fortunes for the few, and afforded the venturesome classes a convenient medium for gambling, has resulted only in harm to the many. It is not our purpose now to recount the effects of this business during the past 20 years: suffice to say, it has been most malign; falling like a blight on every class, pursuit and interest of our people. It has proved ruinous to thousands, and these belonging mostly to that middle rank in society, who earn what they spend and can but ill afford to lose what they earn. Nor do we intend at this writing to arraign the men who have been responsible for so much disaster and suffering, our object just now being to simply warn these men that another of these raids on the laboring classes of the investing public had better not again be attempted.

During the few years that have elapsed since the subsidence of the stock-dealing furor, our working people—that is, such of them as had not become wholly bankrupted and ruined—have partially recovered from the effects of that business. Cured of the craze that so long afflicted them, they have deserted the halls of the stock-sharp and the dens of the manipulator, and once more betaken themselves to work, content with the earnings of their respective vocations. Debts contracted have been paid up; homesteads have been relieved of incumbrances; lots have been bought and new houses built, and little hoards have again begun to be laid up in the savings banks.

But, now that something of the old-time prosperity and contentment have been restored, we may look for an effort being made by the wily operator to capture the coin of the toiling masses. For some time past a scheme has been maturing for getting up a stock boom, and unloading the worthless rubbish that has been accumulating in a few hands on the unsuspecting public. As yet, not much headway has been made with this nefarious business, principally because the public cannot now be victimized as easily as aforetime, and partially because the newspapers on this coast, including those that make stock operations a specialty, have refused to promote or even encourage any movement of the kind. Our entire population are now so heartily sick of this form of gambling, that it can never hope to be reinstated here in anything like its pristine vigor. Even in the Atlantic States, where it never became so wide-spread as here, it is being regarded with such distrust that the number of its votaries has fallen off largely of late.

It is to be observed, too, that Eastern investors do not submit to be imposed upon as tamely as has been the practice among us, parties there seeking redress of their grievances in the courts, which are apt to regard complaints of this kind with favor. A number of suits are now pending in that section of country, brought to recover money paid for properties known to be worthless, or of little value, some of these suits relating to transactions in stocks. Several operators, once prominent on this side of the continent, are said to be threatened with suits of this kind. It is also reported that a work of a rather sensational character is being prepared and will soon be published in New York. As this work emanates from an insider, and will make some spicy revelations touching one or two old time San Francisco operators now domiciled in New York, it promises to make a stir in mining circles. It will, also, so the story goes, tend to relieve parties on whom the odium of the State Line deal has thus far rested, of some share of that burden, and transfer the same to certain "honest miners" living on this side.

But this publishing books and going to law as a means of redressing wrongs or recovering money foolishly expended, is costly, vexatious and uncertain, and, however it may suit eastern investors, who have been wronged and robbed, has never been popular with Californians, who, when they have been taken in by stock sharps or otherwise made a bad venture, have shown themselves disposed to submit quietly rather than make open complaint, as perhaps they more generally ought to have done. The better way, however, is to avoid exposing one's self to be cheated, as one is very certain to be if he suffers himself to be enticed into taking a hand at the strap game, or dealing much in these mining shares.

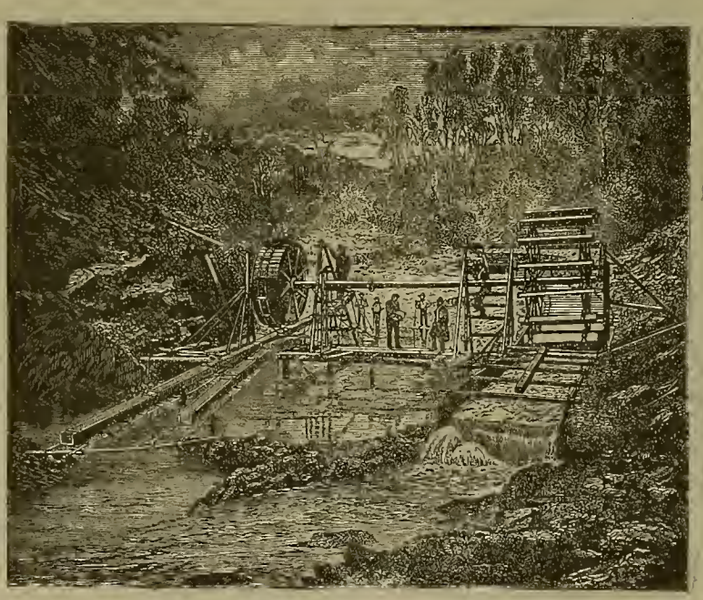
THE wastage at the Mint under the present Superintendent in the coinage of $20,000,000 gold and silver during the past year was less than $1,000. This is a splendid record.

THE Cholera, which has been raging in the cities of northern Egypt, has appeared in Berlin, rendering its spread over Europe, probable.

The Forthcoming Report of the Director of the Mint.

From advance sheets of the report of H. C. Burchard, Director of the Mint for 1882, we gather the following information in regard to the product of bullion in California for that year. The output of gold amounted to $16,800,000, silver $145,000, making a total of $16,945,000, being $1,300,000 less than the product of 1881. This diminution is attributed by Mr. Burchard to a falling off in the product of the Standard mine, at Bodie, amounting to $900,000, and of the hydraulic mines, some of which were prevented from running by injunctions issued from the courts. To these causes might have been added the fact that gold mining in California has, for the past two or three years, been in a sort of transition state—foreign capital withheld and not much home capital coming in to take its place. Not this year, but next, we may look for an advance in the bullion product of the State, and which, once begun, may be expected to be kept up for a number of years thereafter.

There has been some fault found with the year's output of bullion assigned by the Mint Director to certain localities. This originated, at least in one instance, from a figure having been left out of the returns made by that official, as telegraphed on from Washington. This was in the case of Nevada county, which, as will be seen, by consulting the table we publish, is credited by the Director with $3,510,000, all that it is justly entitled to; nor do we think that any other county has just reason to complain in the premises. Were the Director of the Mint to adopt the estimates of local authorities we would be able to make a right royal exhibit of gold here in California. And it would seem that Mr. Burchard, in deference to this class of authorities, made his aggregate figures somewhat larger than those of certain very competent statisticians on this coast. Nevertheless, we are of the opinion that his returns closely approximate the production actually made, as closely, in fact, as it is possible to do. For more full and detailed information on this subject we refer the reader to the article prepared by Mr. Burchard, to be found in another column.



MODIFIED CHINESE PUMP.

Special Students at the University.

The next year's work at the University of California will begin the second week in August. The coming class, according to indications furnished by the June examinations, will be larger than for several years. The institution is now in excellent condition; some cases of discipline during the last few years have had a wholesome effect, and the moral and working quality of the students has been very satisfactory.

The question often arises as to what a young man can do at the University who has not time nor means to pursue a regular four years' course. Provision is made for such students. Those applicants of suitable age, who can pass an examination showing that they are qualified to profit by the instruction given, are allowed, under the advice of the Faculty, to make up a "Partial Course" from the essentially agricultural studies, and such other topics as may be most important in view of previous attainments. Graduate of High Schools, Academies and other institutions giving thorough drill in the usual English studies and a fair start in the natural sciences, can in two years acquire that which should be of great value to those who wish to pursue agriculture intelligently.

The privilege of being a "Special Student" of one or more subjects without a full schedule is granted only to those of mature character and age. Although these two classes of students are not candidates for degrees, they can on leaving obtain certificates showing what studies have been pursued, and with what success. Students who work in the analytical laboratories are charged for chemicals and other materials used.

Persons not members of the University may obtain permission to attend any course of lectures by application to the Faculty, or to the lecturer, giving the course.

Thus the institution is open to those who cannot avail themselves of all its benefits, and the accommodating conditions arranged by the Faculty should lead all who can to enroll themselves for the coming year.

California Pump.

The California pump is essentially a chain pump. A rectangular box, about 10x3 inches, inside measurement, and ranging from 10 to 30 feet in length, according to need, is traversed by an endless flexible, band or belt of canvas, on one side of which are securely fixed, at intervals, wooden discs, nearly as large as the inside of the box. The lower end of the box is furnished with a roller, round which the belt passes, and is immersed in the water to be raised from the pit, while the upper end delivers the water into a trough, or launder, by which it is carried away. At the upper end, the belt passes round a second roller or drum, which is made to revolve by either hand or water power.

This pump, a simple and efficient apparatus, is a modification of the Chinese pump, having been originally introduced here by that people. The principle on which it is operated belongs to them, though we have greatly improved on the original structure, which was made wholly of wood. Even the belt was composed of short pieces of board, hinged together with wooden pins.

CORRESPONDENCE.

From Vulture to Prescott, Arizona.

[From our Arizona Correspondent.]

Copper Mining.

From Vulture to Prescott there is a scope of hills and valleys of sixty miles, affording several different cattle ranges, ample room for cattle on a thousand hills, and feed for a thousand cattle to graze on one hill. The stock of cattle noticed seemed to be generally of very good grade of American stock, and the same with a few exceptions is true of the horse stock, and all having plenty of feed on the open domain.

The Securing of a Spring

Or well with water in it is securing the control of a large scope of country. Sixteen miles from Vulture over the old quartz road brings you to Wickenburg—rather where it once was—a busy, bustling little town with a forty-stamp mill and several stores, saloons and hotels. Now it is almost a deserted camp. The village smith, finding his steel and iron bars of little demand, opens a small refreshment bar for the wayfaring man. A store and postoffice and a boarding-house, and stage station with a U. S. Telegraph and supply depot, for government trains, now comprises the major portion of what used to be a very lively town. The concentration works of M. Salsbury, Supt. of Benson Smelting Co., now erecting there for operations on the old Vulture tailings, and the renewed interest taken in more thoroughly prospecting this locality will somewhat revive the town and fill some empty bonses. From Wickenburg, sixteen miles by the old wagon road, shows only rough, rolling pasture land with but one settler till you arrive at J. R. Frink's stock ranch, where are exeellent water privileges and an immense range occupied by his numerous bands of horses and cattle. Here my Pimo Daisy, by a special breach of trust, took a promenade with common, loose stock, and cost

A Three Days' Search

Before she could be captured and brought to a proper line of duty. I felt perfectly satisfied that Mr. Frink had ample scope for more than 40,000 horses to feed and fatten. Ten miles and 20 miles are common distances between these different watering springs and stock ranges.

In Skull valley are several families of farmers and stock men, and a thriving school, with a literary society, organized for literary and social improvement. One cheese dairy of 24 cows was running, finding ready sale for the cheese. The hay cut always has ready sale at good prices, either at home or at Prescott, 20 miles to the northeast, over good mountain roads.

Prescott,

The territorial capital, and county seat of Yavapai county, with a population of about 2,500, is very pleasantly located in the midst of granite hills and mountains, and surrounded with pine forests, which, with the elevation of 5,500 feet, insures abundance of cool, refreshing breezes. The city is, in all its features, American—that means regular, wide streets, kept clean; good business houses and substantial public buildings, and a mild city government. Of the business portion, the center block was left an open plaza, and now contains the county Court House, built of brick, two stories above basement, with cupola and town clock. There are five churches, a large two-story brick public school building, a dramatic and theatrical building, and halls for the fraternal societies, and a large brick used below by the Bank of Arizona, and above for territorial offices and territorial library. Many of the stores are large fireproofs, carrying very large stocks of goods. The latest improvement is the large and commodious hotel "Sherman House," erected by M. H. Sherman, a stirring territorial pioneer, and now leased by H. M. Hughes, an experienced hotel man, who places this before the public as a first-class house for tourists and families. Last Sunday the dinner tables served nearly 200 guests to a very inviting bill of fare.

But the more emphatic American feature of the city is expressed in the fact that three able and readable daily newspapers are published here, with their accompanying weeklies, and on every occasion of important news free extras are distributed promptly through the city. All of these are endeavoring to encourage and sustain the brave pioneers of our new Territory, and to let the distant lands know there are here rich grazing lands not used, where enterprise would easily develop the water for stock; that there are in these mountains vast deposits of gold, silver, copper and lead that offer ample remuneration for capital and labor expended in their development.

Too often the pioneer newspapers are not given half the credit due them.

The Whipple Post is within a mile of the city and forms quite a suburban town, adding much to the good literary society of the place, as well as to the scenrity of the multitude of scattered mining camps in this vicinity. The officers and their families are highly esteemed. The electric light is now to be dispensed to the city of Prescott as some of the most energetic citizens have a franchise for introducing the Brush and Swan lights. The climate of this portion of the Territory is very nearly perfection itself. Every day has pleasant refreshing breezes, and cool bracing temperature at night. Mining work can be pursued twelve months each year.

I very much doubt if there is an average of any better climate in any State or Territory than these mining hills of Arizona.

Asthmatic Subjects

Will here find relief. Mr. I. Miller, an old resident of Santa Barbara was, on account of asthma, obliged to leave there, and was induced to come to Arizona, and after a few days residence in Phœnix (only 1,800 feet elevation) he told me he was entirely relieved of his old trouble. So he opened up trade in that town. Some afflicted one may say: "How can I get there, or to the higher town of Prescott?" The Southern Pacific R. R. brings you to Maricopa station, either from east or west, and a splendid through line of stages lands you quickly in Prescott or any intermediate place. This stage route shows you Gila and Salt river valleys, the grandest valley farms of Arizona and some rich hill scenery, as you pass over 150 miles across the Territory. Or the Atlantic & Pacific R. R., now completed to connect with the Southern Pacific in California and Santa Fe R. R. at Albuquerque, will bring passengers for this place to Ash Fork, and a pleasant stage ride of only sixty miles to reach Prescott.

This route passes near the

Grandest Scenery of this Continent,

And ample provisions are making for tourists to enjoy these sights with safety and with very trifling additional expense. The students of geology will find in these deep gorges of the Colorado, the largest illustrated work on stratification and the crust formations of the earth. The student of astronomy, from these deep gorges can study the visible starry firmament at mid-day.

When the Colorado River R. R. bridge is completed, this road will be an important thoroughfare. Northern and middle Arizona property will be tripled and quadrupled quickly in value. This section has already caught the inspiration of success, and capital is flowing this way, and development is fast supplementing the efforts of the brave and self-denying prospectors. Capitol is building roads, and erecting mills, and lead and copper smelters, and the teams that bring in merchandise and coke are freighting bullion for back loading to the railroad.

There will be, through the assistance of competing railroads, a greater advancement in this section of Arizona within the next two years than was made in the ten previous years.

Capitalists are now using the best practical experts as explorers, and investing freely on their reports after thorough tests and examinations of properties.

The Great Opportunity to Invest

In large mining properties at present reasonable figures, from the very nature of the case cannot long exist, especially to find properties in midst of well organized and thoroughly protected society and under our own laws. There are now scattered over this belt of rich mineral deposits some few gronps of mines, that some single ledge of the group, would be ample for an extensive plant, that would pay millions in dividends. To illnstrate: The Howell Co. own a group of mines that were bought by Partridge Brothers for $35,000 of the locaters, and for good measure or as "pelon" the Belle Mine was thrown in. This Company developed the property at an expense of a few thousands and sold to the Howell Co. for $75,000; a very handsome advance on cost, but in the estimation of an expert, was no appreciable fraction of the real value of this one ledge that was then so slightly esteemed, and is now proved to be ample to run the largest reduction works in the Territory.

I speak of the situation as I see it, after spending over twenty years in mines, and am free to say I own not even the fraction of any mine or real estate in the Territory.

It seems very certain that properties most eligible and convenient for working with profit will soon be taken up by those able to hold them, as safe and permanent investments. There are many gold, silver and copper mines located and being developed within a radius of twenty-five miles of Prescott.

The Black Hills district excites the astonishment of those who visit it, and Turkey Creek district rejoices in rich horn silver that will assay over twenty thousand dollars to the ton, and promising well for continuance as they sink down on a lead of two feet, with strata of this character of free milling ore. But of this I will say more after visiting the claims, and will now notice something I have seen.

The Bonanza Copper Mines of Arizona.

The Copper Basin mines are located ten miles west of Prescott. This property, belonging to Copper Basin Copper Company, of which Colonel C. C. Bean, of Prescott, is President, and J. B. Tappan, Secretary, is composed of more than twenty distinct locations made in strict accordance with requirements of United States mining laws; each claim with not less than $500 worth of prospect work and all other requirements complied with, and the proper applications made for United States mining patents, which will issue for same in a short time.

These claims, with the water rights and requisite grounds for reduction works, covers an area of about 440 acres in the basin, thus precluding any possible collision with any other title or claim to title.

This property is now reached from Prescott by the old military road which passes directly through the basin to Fort Yuma. From the basin to A. & P. R. R. it is a direct natural, and most of the way a valley road and only fifty miles to Ash Fork depot.

The basin is located in granite and soft granite, quartzite and sandy conglomerate rocks. The higher rim rocks are of a more solid granite and porphyry. The basin is four or five miles long by one to three miles in its irregular widths. The bottom of the basin is very rough and broken up by ravines, hills and small mineral mountains, steep and precipitons, the bare rocks in many places showing the rich copper stains when a great distance from them. From a tunnel started in where was an old Indian cave with some bones and relics found, they find native soluble bluestone or sulphate of copper in large masses, and some of the bones were coppered over.

We found the soil heavily impregnated with copper salts, oxides and decrystalized or anhydrous sulphates almost everywhere, but in some places to a high working per cent, as proved by tests made by Prof. Treadwell and others. The various classes of different carbonate oxides and chloride ores are here in abundance, with frequent showing of native copper, but that which astonishes the visitor most is the sand conglomerate of richest green and blue hues assaying in copper to the high average of fourteen per cent, and sometimes showing native copper in nuggets and in connection with the red oxides. This ore is so very abundant that it would be much harder to tell where it is not than where it is. The banks of the creek bed have it in heavy mass. You ascend the bank and strike the pick in the ground and pry out a piece of soft rock, and you have this same sandy conglomerate. Tons of rich broken pieces and some nuggets of native copper have been sacked and piled up near the camp, and on other portions of the ground experienced judges of ores become entirely bewildered in attemping to estimate the value or number of tons of pay ore now above the surface and in the surface soil, and they dare not put it at less than 1,000,000 tons.

Prof. Geo. A. Treadwell, an expert in copper, assaying and metallurgy, spent some days examining and assaying from all varieties of the ore, and from eighty samples assayed, he got an average of sixteen per cent copper. From the bottom of a shaft twelve feet deep, sunk in bottom of the ravine for testing the water-flow—which is abundant in all the ravines—some heavy sulphuret ore was taken out, samples of which assayed $10 gold and $15 silver to the ton, and 24½ per cent copper. Up on the side of one of the hills, in the basin, a shaft forty-two feet deep showed a well defined ledge of rich ore, with regular increase of size and quality as the depth was increased.

A number of very interesting points and proofs of the ubiquity of the pay ore, both in and on the ground, would all simply go to enlarge the assurance that this is a copper property, destined in the near future to rival, if not equal the best that Lake Superior ever saw.

A visitor with me, representing the Chicago Furnace Manufacturing Co. of Fraser & Chalmers, a man quite familiar with copper mines, thought the "Calumet," and possibly one other Lake Superior mine could now show a greater property than this copper basin. If with only small prospect labor and that on more than

Twenty Different Claims

This will bear any comparison with one so fully developed, it is the highest commendation. The forests of excellent pine timber, for lumber, that abounds within three miles, the pines and junipers and some hard woods are near and abundant for charcoal. Coke can be delivered direct from the railroad to the basin, when teams will have freight both ways at about $25 to $27 per ton. But when the branch railroad from Ash Fork to Prescott is built there will be a large margin for profits saved from the expenses of present running.

So with all the naughtiness of the railroads in getting rich too fast, they are now a great convenience, and are

Opening Up the Mines

And actually placing the bullion markets and sources of supplies at very convenient distances. The distant invalid capitalist can conveniently visit his Arizona mines, his stock ranch or his valley, grain and fruit lands without enduring any severe trials of journey or suffocating heat, or fear murderous Indians. The miner can conveniently work within or without his mine all the year in this climate. No severe extremes of heat or cold. A short rainy season in June and July comes as a refreshment to all. I did not attempt to detail the multiplied evidences of thorough, well defined and encased ledges here opened on the various claims, for they are too many to particularize, and each seems to carry proof of being in itself a large, reliable high grade copper mine. Over $17,000 has been expended in the prospect work and patent expenses on this property.

This property has attracted the attention of many distinguished visitors, and after they have clambered up to the tops of the highest buttes in the basin, and there find the rich copper veins traced from the base up, and everywhere on the flats find the soil full of it, they seem lost to express the possibilities of such a mining property if provided with the best facilities for reduction. One visitor, and extensive observer of mines, pronounced this "the largest and most important mining estate in Arizona, and possibly in the United States."

Last December George A. Treadwell, representing an English syndicate, bonded this property for the sum of $3,500,000, which bond expires with July 1, 1883. Mr. Treadwell, generally recognized as a very safe mining engineer and expert in mines, very carefully examined this property, and, after days of testing, admitted, at least, $7,000,000 worth of ore in and above the surface soil.

It is possible that the routine work of the Land Patent Office will not be completed and papers transferred by July 1st, and this may interfere with the transferring of the property on time as specified in the bonds now on record here. Even should this negotiation entirely fall through, other capital will soon take hold of such a property.

Col. Bean and family will start for New York in a few days, carrying with them the high esteem of all their acquaintances here.

B. W. CROWELL.

Prescott, A. T., June 20, 1883.

Natural Resources.

That small portion of our county which has been partially prospected for auriferous quartz, has not only proven rich, but has natural resources for the working of its ores which are seldom mentioned by the prospector. Our mountains are covered with the tall white pine, the tough spruce, the golden tamarac, and the hardy oak, all of which can be had in abundance for the erection of mills, the timbering of tunnels, and the thousand and one uses to which timber can be applied in the workings of a mine. Every mountain gorge pours down its silvery torrent, and the clear waters are to the mill man the motive power wherewith to drive his mill. Our quartz lodes, owing to the mountainous character of the county, are easily worked, there being invariably gulches or canyons from which tunnels can be driven which will open and drain the veins hundreds of feet below the surface. Why then do not our prospectors reflect for a moment on the advantages thus bountifully given by a lavish Nature? In all of the flat or rolling country, where quartz mining is pursued, every mine, in order to be extensively and successfully worked, must first have its steam engine with which to run a mill, pump the surplus water from a mine, and hoist from its levels the pay ore and the tons of waste dirt and rock for which there is not room in the galleries below. After descending a few hundred feet the machinery required for this purpose is of such ponderous dimensions that its cost is a fortune, and before the mine is fairly opened its owners are at an expense of thousands of dollars. Here in the mountains everything is changed in that respect, and with only a nominal capital the miner can open his mine and crush the rock taken from it, at a vast deduction from the expense in less favored localities. In Montana and Idaho the amateur miner from the East, we are told, looking for a pretty location, used to erect his quartz mill out in the level plain on the banks of some grand river, and transport the ore from his mine—sometimes 30 miles distant. This kind of kid-glove mining may be very romantic, but does it pay? Our miners may wish to find suitable spots upon which to erect their mills, but we think none of them would ever go down to the valley of the Sacramento to locate a millsite, and haul their quartz from this locality, to be crushed in a mill in operation there. No, we have millsites at our door yards, and water to drive our mills with, and timber for our buildings, and what is better than all, we have veins of metalliferous ore extending through our county too vast for imagination. Where we have all these natural advantages will not this section of the country, by the appliance of a little enterprise and energy, again produce wealth as in its palmiest days?—*Sierra Tribune.*

THE OUTSIDE.—Louis Betz, who left here some six weeks ago to hunt for a new locality to locate, returned the other day. During his absence he took a trip over the Denver and Rio Grande Railroad, and visited a number of the mining towns of southwest Colorado, and, with the exception of Gunnison city, he saw none that showed the least signs of stability. At this place there are iron mines, and wealthy companies are erecting large iron and steel works. Silverton he reports as being nothing but a hurrah whisky-drinking railroad town, overrun with thieves and cut-throats. It has no foundation whatever that he could see on which to build. At Ouray they are working 20 men in one mine, and these are all the men working. There are no reduction works at Ouray, and what little ore extracted shipped to Pueblo for reduction. The people of Ouray are living on the expectations of a boom visiting them this summer. He also visited the "Red Hills," about which there are such great tales in regard to the richness of the mines floating through the country. While there he saw no mines. There were from three to six feet of snow on the ground. The mining locations are made on top of the snow, the stakes driven in the snow, and no person knows what is beneath the snow. It is the opinion of many who visited the Red Hills that when the snow melts away so will the rich mines.—*Pioche Record.*

MECHANICAL PROGRESS.

A Portable Ingot Regenerator.

We gave in these columns several months since a full description of the Gjer Soaking Pit, by the aid of which an ingot of steel may be carried from the converter through the entire process of rolling into rails or bars without reheating. This "soaking pit," however, was a very massive affair, built of brick, and stationary, being located directly by the side of the converter.

Quite recently, Mr. Jacob Reese, of Pittsburg, has patented a portable "soaking pit," or regenerator, which appears to possess quite important advantages over the Gjer pit. This new device is described as follows by the *American Manufacturer:*

This regenerator is composed of a nest of eight vertical chambers, each chamber being of such size as to admit and envelop an ingot when placed in it. The walls of these chambers are two inches thick, and the whole set of chambers is made in one piece of Bessemer steel. This shell is placed on a carriage, and is surrounded with brick or some other good non-conductor of heat. The regenerator is provided with lids to cover the cells at the top, and with openings and doors for closing them at the bottom of each cell. When it is required for use, the carriage containing it is run under a hood communicating with the furnace, the caps and doors withdrawn, and the hot gases forced through the hood down through the cells and out of their bases, until the regenerator is properly heated. It is then withdrawn, the bottom doors closed, and the caps placed upon the cells. When the ingots are removed from the molds, they are placed with their small ends down, in the cells, and the lids placed over them. When the regenerator is fully charged and hermetically closed, to exclude the air and retain the heat, it is taken to the blooming mill, and a second regenerator is run into the converting house and employed in the same manner. When the ingots are taken from the mold they are only solidified to the depth of about one half an inch, while the center is in a molten state. As the outside is too cold and the inside is much too hot to be rolled, by placing the ingots in a hot regenerator, in the space of twenty minutes, more or less, the temperature of the ingots is equalized, and they may be taken from the regenerator and rolled or hammered without the use of any reheating or consumption of fuel, and what is more important, without being burned or losing weight, by oxidation.

When an ingot is withdrawn, the lid or cap is again put on, and when the regenerator is emptied it is run back to the converting house and again filled. When an ingot is placed in the regenerator it takes up heat from the walls of the cell, and the internal heat passes to the outside of the ingot, and thus it becomes of a uniform heat, but of too high a temperature for rolling. The walls of the cell then absorb heat from the ingot, and thus the ingot is permitted to pass from the molten to the solid state more gradually and more uniformly than by the old practice. Mr. Reese claims that the steel walls of his cells will give the heat off and take it up much more rapidly than any kind of brick, and that the regenerator lined with iron or steel will last much longer than if lined with brick. So that he has a good heat conductor next to the ingot, and this is surrounded with a good non-conductor of heat. Mr. Reese claims that this invention will save labor, fuel, repairs of furnaces, sand, and waste of iron to the amount of over two dollars per ton.

A CHANCE FOR INVENTORS.—In the heavy thunder storms which occurred in various parts of the country last week the lightning manifested its well known affinity for petroleum. Three large oil tanks were struck. One of them was near Olean, in this State, another at Muncy Station, Pa., and the third in the yard of the Standard Oil Company at Communipaw, N. J. This last one had very little oil in it, and was not consumed, but the others, with their contents, were burning at the latest accounts. The attractive influence exerted by petroleum, or its vapor, which renders these great oil tanks so liable to destruction by thunderbolts, does not seem to be very well understood. If it was, we should hardly be without any efficient means of guarding such structures against lightning. The subject is well worthy of attention and study on the part of men of science. At present the safeguards are so inadequate that an oil tank is not only very likely to be destroyed by any thunder storm, but to act also as a firebrand to every building anywhere near it. The inventor who devises a method which shall afford to oil tanks absolute protection against lightning, ought to be able to make a million dollars by the invention.—*N. Y. Sun.*

DIFFUSION ENGINE.—At a recent meeting of the London Physical Society, Mr. Woodward described an experiment illustrating motion produced by diffusion. A porous reservoir of clay containing air was suspended from one end of a weighted balance beam. A glass tube projected from it below and dipped into a vessel of water. A jet of hydrogen gas was allowed to play on the outside of the reservoir, and the balance beam began to oscillate. This is an adaptation of Graham's well known experiment, and is, in fact, a diffusion engine.

Things to be Kept in Mind by Every Mechanic.

Great care should be bestowed on the hanging and care of shafting. A line of shafting should run true and smoothly without jumping or jerking. If a line runs true and the pulleys do not wobble, or the boxes exude oil, it is a real delight to a good mechanic and like "a thing of beauty a joy forever."

A mill or machine shop should be erected with a view to its permanency. The foundations should be strong and rigid and the timbers sound and well seasoned. Springing and shrinking timbers and settling walls cannot give the necessary support to machinery nor reduce friction to a minimum.

The reason of unsatisfactory running of shafting is not always its location in an improperly constructed building. The millwright is often at fault in not hanging the shafting properly.

When the shafting is properly hung and the machinery in operation, the line should be inspected every now and then and any defect which may appear remedied.

This is often found necessary with the best hung shafting in the best constructed building if the economy of power is worth looking after, for there are so many disturbing causes affecting the integrity of a line that it is impossible to depend on long continued accuracy unless constant attention is given to the condition of the shafting.

A box slightly out of line or level will absorb a large amount of oil, and yet be continually hot, waste power by unnecessary friction, besides grinding and cutting the shaft. It will always pay to attend closely to such matters.

In friction gearing no power is wasted by loss of friction, the friction itself being the means used to transmit the power, and in point of economy it exceeds belting or cogs. The driving pulleys may be made of well-seasoned wood, and the faces can be beveled so as to communicate power in any direction.

Where a friction pulley is used, the boxes and journals will not heat to any extent, as the pressure can be made uniform by an idle pulley made of wood and placed on the opposite side to counteract the pressure. This cannot be done with a belt.

INCREASED EFFICIENCY OF RAILWAYS.—Mr. Wm. P. Shinn, of New York, and formerly Vice President of the Alleghany Valley railroad, has prepared for the report of the Chief of the Bureau of Statistics, a statement upon the increased efficiency of the railroad system of the United States. His paper, which is a very interesting and valuable one, shows that on three leading railroads, viz.: the New York Central & Hudson River, New York, Lake Erie & Western, and the Pennsylvania railroad, the traffic increased during the decade ending 1880, from 2,682,603,465 ton miles in 1870, to 8,263,038,412 ton miles in 1880, or upwards of 300 per cent. The means by which this enormous increase in traffic has been secured, Mr. Shinn attributes to the following causes: First, improved track or "permanent way," including bridge superstructure. This is largely due to the adoption of steel rails. Second, additional sidings, and second, third and fourth tracks. Third, increased capacity and strict classification of locomotives. Fourth, increased capacity of freight cars. Up to 1876 the standard capacity of freight cars was 20,000 pounds, in 1877 a few were built to carry 30,000, and since 1879 the standard cars, both of the East and West, have been built to carry 40,000 pounds. Fifth, additional terminal facilities. Sixth, improved methods of signaling, embraced chiefly in the establishment of the "Block system." Seventh, running locomotives "first in, first out," and running freight trains at a higher rate of speed.

A MECHANICAL WANT.—If the builders of machines for specific purposes, says a mechanical exchange, would accurately determine the power required to drive them, and furnish this information to the purchaser, they would not only do him a favor, but would render important assistance to the science of engineering generally. With this knowledge, the providing of the proper power for projected enterprises would be greatly simplified, fewer and less costly mistakes would be made, and a better general economy of motive power result. As it is, with the exception of a few old and prominent industries, the power required to drive the different machines, and hence the total power required for a contemplated plant is, to a great extent, a matter of conjecture, so that unless the comparison can be made with a similar establishment already in operation, the probabilities are entirely against a judicious selection in the way of an engine to furnish the power.—*Age of Steel.*

THE LARGEST AGRICULTURAL MACHINE SHOP.—The most extensive agricultural machine shops in the world are at Springfield, Ohio. There are five in all. A good idea of the immense size of one workshop may be obtained by imagining a building almost 17,000 feet in length by sixty feet in width, a continuous room three miles and over in length. At each minute a completely made machine is rolled from the stocks and housed or shipped to its destination; 600 machines from sunrise to sunset—an annual production of 100,000 implements.—*Mechanical Engineer.*

SCIENTIFIC PROGRESS.

Molecular Vibrations.

No scientific doctrine is more generally believed than that of the conservation of force. The great students of nature almost universally accept it. So many old and credited theories have been overturned that advanced thinkers are prepared to see this one share such a fate. This is a possibility only; the theory is considered eminently a proved and true one.

Briefly stated it amounts to this: In the universe there is no natural power known to us that can create or destroy force. All that man can do is to transform it and change the form of its manifestations. Whenever force becomes manifest to us, we can trace it back to anterior forms. It never appears spontaneously generated, and from no origin. Heat, one form of force, can be changed into useful efforts. It is assumed to represent an intense vibration of the molecules. The minute heat vibrations of the molecules, which create impulses infinite in number, and, considering the size of the molecules, of almost infinite force, can be lengthened, and made to coalesce into a single prolonged effort. A cubic inch of water may be heated, by the combustion of carbon, until the repulsive force among its vibrating molecules has developed, and the paths of vibration have been increased to twelve times their former length. Thus steam is produced. The steam may be admitted into a cylinder, under a close-fitting piston, which it will raise until the space under the piston is of one cubic foot volume. If the steam is allowed to condense, the piston will return. The minute vibrations of the molecules, too small to be measured, or fully conceived of, have been joined together so as to produce a single wave of a foot front, it may be, and of a foot altitude. The first phase of an oscillation is represented in the rise of the piston; its descent represents the second. The motion of the piston only renders the expansion of the water into steam visible in its effects. The true transformation of power was anterior to all this. The proximate origin of the force was the combustion of the fuel.

The chemical affinity of carbon for oxygen was called upon. These two elements were made to unite. They rushed together with very great yet measured velocity. As molecule of carbon came against molecule of oxygen, it was split up into atoms, and immediately combined with the oxygen. Under the effects of the atomic concussion, the newly formed molecule of carbon dioxide started into vibration. The vibration was one of that character which affects our nerves with the sensation called heat. The myriad of vibrations was imparted to the cubic inch of water, and a measure of their amount arrived at. It came to some 2,000 foot pounds.

This, it must be remembered, is theory, and unproved except by analogy. The resemblance between the phenomena of sound and heat is very great. Both can be reflected and refracted; both can start from a center and be radiated through space, in accordance with identical laws Sound is unquestionably due to vibrations. They can be seen by the unassisted eye. Such are the vibrations of a long string or tuning fork. From the analogies between the phenomena of sound and heat, the conclusion is drawn that heat is also due to vibrations.

We reach thus a true conception of the theory. Heat vibrations are invisible. They have been invented by scientists to explain exisiting phenomena. The proof of their existence is an analogical one only; and analogy has so often failed that the whole theory is provisional. The probability of the existence of the vibrations is founded on their capability to explain known facts. As soon as a discordance is shown they must be abandoned by the theorizer. As soon as such discordance between their existence and the phenomena of nature is shown, the proof and probability of their existence vanishes.

The weakness of any attempt to seek among molecular vibrations for a new source of force is thus very evident. They serve only to illustrate the possibility of the mutual transformation of different kinds of force. They are not absolutely known to exist, and may at any time be discredited, and a new theory be adopted. To take such an unproved and unknown quantity as a reservoir of new and hitherto undiscovered power is going beyond the bounds of analogy or probability.—*Cor. Scientific American.*

FILTERING DISTILLED WATER.—Eiselt recommends the use of sponge for filtering distilled water. The filtration goes on with great rapidity, and the product is clear as crystal. When filtered through paper, distilled water soon exhibits a felty sediment, which is never formed when filtered through sponge, so that the bottles scarcely need cleaning after several months' use. The apparatus that he employs consists of a bottle with an opening near the bottom from which descends a bent glass tube. This tube is about 6 inches long and 1 or 1½ inches in diameter; at each end is a perforated rubber stopper bearing a narrower glass tube. The wide tube contains one or two long strips of fine sponge that has been cleaned with dilute hydrochloric acid and then dried. The bottle to which this filter is attached must not be larger than the one placed beneath to catch the filtrate. The sponge, of course, must be cleaned every few months.

CONVERSION OF NEBULÆ INTO STARS.—The whole range of astronomy presents no speculations which have attracted more attention than the celebrated nebular hypotheses of Herschel and of Laplace. We shall first enunciate these speculations, and then we shall attempt to indicate how far they seem to be warranted by the actual state of scientific knowledge. In one of his most memorable papers, Sir William Herschel presents us with a summary of his observations on the nebulæ, arranged in such a manner as to suggest his theory of the gradual transmutation of nebulæ into stars. He first shows us that there are regions in the heavens where a faint diffused nebulosity is all that can be detected by the telescope. There are other nebulæ in which a nucleus can be just discerned; others again in which the nucleus is easily seen; and still others where the nucleus is a brilliant, star-like point. The transition from an object of this kind to a nebulous star is very natural, while the nebulous stars pass into the ordinary stars by a few graduated stages. It is thus possible to enumerate a series of objects, beginning at one end with the most diffused nebulosity, and ending at the other with an ordinary fixed star or group of stars. Each object in the series differs but slightly from the object just before it and just after it. It seemed to Herschel that he was thus able to view the actual changes by which masses of phosphorescent or glowing vapor became actually condensed down into stars.—*Popular Science Monthly.*

LIQUID GASES AND SOLID ALCOHOL.—M. Cailetet, a French chemist, some time ago succeeded, by liquefying ethyline and causing it to boil, in producing a temperature of—105 C. (—157° F.), at which he liquefied a few gases under strong pressure, and even caused oxygen to approach the liquid state. Mr. Wroblewski, of Cracow, one of his pupils, continuing the experiments, has, by boiling liquid ethyline in a vacuum, produced a temperature of—136 C. (212.8° F.), at which sulphuret of carbon and alcohol were congealed, and oxygen and nitrogen became liquid. The changes in the form of oxygen were obtained on the 9th of April in three experiments, in which the conditions of pressure (22½ to 26½ atmospheres) and temperature were slightly, but not essentially, varied. Liquid oxygen is transparent and colorless, differing in this from ozone, which is deep blue. Liquid nitrogen has a similar appearance. Sulphuret of carbon is a white solid at—116 C., but becomes liquid when raised to—110 C. At 130° alcohol assumes the form of a white solid, which becomes viscous at 129°. Carbonic oxide was liquefied under similar conditions with nitrogen.

SCINTILLATIONS OF STARS AS AFFECTED BY THE AURORA BOREALIS.—According to *Les Comptes Rendus*, M. Ch. Montigny, observing for many years at Brussels, has noticed, as previous observers have done, that the scintillation of stars is much increased during the occurrence of an aurora. He has noticed, further, that every aurora "produces immediately its effects upon the scintillation;" that stars in the north are most affected, and that the influence of the phenomenon is most marked for the stars which are observed across the upper regions of the air. Magnetic disturbances also, even when accompanied by no aurora visible at Brussels, increase the scintillation to a marked extent. On two occasions during July, 1881, the effect of magnetic disturbances was observed with no aurora visible in Brussels, or even, so far as can be learned, in any part of Denmark.

TRANSMISSION OF SOUND THROUGH ROCK. Herr F. Schell, of Grund, recently described some observations made a short time since, in the course of mining work in the Hartz mountains, on the distance through which sounds are transmitted in rock. In a horizontal direction the firing of shots at the face of a crosscut has been heard in a crosscut driven toward it, the face of which was 447 feet distant from it. A level was driven on a vein at a depth of 538 feet below the surface, and happened to strike 187 feet distant in a horizontal direction below a stamp mill dropping stamps, weighing 330 pounds. The dropping of the stamps on the surface could be distinctly heard in the heading below, which, in a direct line, the hypothenuse of a right-angled triangle, was separated by 571 feet of rock.

THE ELECTRO-MOTIVE FORCE OF BATTERIES.—Recent experiments by Mr. W. H. Preece, communicated to the Royal Society, Great Britain, show that changes of temperature do not practically affect the electro-motive force of a battery, but they do materially affect the internal resistance. Faraday's observation, that the improved current from a heated cell is due to increased conductivity, is thus confirmed. Mr. Preece's results also show that of the various forms of batteries in practical use, the Daniell is most seriously influenced by variations in temperature, and that in all experiments with that battery, either the temperature must be kept constant or frequent measurements should be taken of the internal resistance of the battery and allowance made for the variation.

PHOSPHORESCENCE IN ANIMALS.—According to Radziszewsky, the luminous animals, like *Pelagia noctiluca, Beroe ovatus*, etc., owe this fact to a peculiar fat that they contain. These little animals do not give light when at rest, but when stimulated give a quick flash of monochromatic light resembling lightning.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

COMPANY.	LOCATION.	No.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Alta S M Co	Nevada	26	25	July 3	Aug 7	Aug 27	Wm. H. Watson	302 Montgomery st
Andes S M Co	Nevada	22	25	June 27	Aug 2	Aug 22	B Ehrris	309 Montgomery st
Argenta M Co	Nevada	16	25	June 21	July 24	Aug 17	E M Hall	327 Pine st
Benton Con M Co	Nevada	10	10	May 26	July 2	July 19	W H Watson	302 Montgomery st
California M Co	Nevada	8	20	June 26	Aug 4	Sept 3	C P Gordon	309 Montgomery st
Caledonia M Co	Nevada	39	20	June 15	July 19	Aug 9	R Wegener	414 California st
Excelsior D G M Co	California	1	5,00	June 5	July 9	July 26	W Cunningham	326 Montgomery st
Exchequer M Co	Nevada	19	20	June 14	July 18	Aug 9	C E Elliott	327 Pine st
Eureka Con M Co	Nevada	4	1,00	May 21	June 21	July 16	P Jacobns	309 Montgomery st
Grand Prize M Co	Nevada	14	25	June 25	July 27	Aug 20	E M Hall	327 Pine st
Gould & Curry M Co	Nevada	45	50	June 15	July 20	Aug 13	A K Durbrow	309 Montgomery st
Hale & Norcross M Co	Nevada	77	50	June 7	July 11	Aug 2	S F Lightner	309 Montgomery st
Independence M Co	Nevada	11	30	May 25	June 28	July 23	J W Pew	310 Pine st
Justice M Co	Nevada	39	10	July 9	Aug 13	Sept 3	R E Kelly	419 California st
Martin White M Co	Nevada	15	25	July 9	July 11	Aug 8	J J Scoville	309 Montgomery st
Mt Auburn M Co		11	20	May 25	June 27	July 16	J H Wilkins	438 California st
Red Hill H M Co	California	8	05	May 24	June 26	July 23	E Hestres	328 Montgomery st
Tip Top M Co	Arizona	6	25	May 29	July 6	Aug 6	H Deas	309 Montgomery st
Wales Con G & S M Co	Nevada	1	25	May 14	June 15	July 16	J H Applegate	320 Sansome st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Alexander M Co	Nevada	2	1,00	June 20	Aug 6	Aug 27	J K Warren	307 Montgomery st
Alaska M Co	California	2	4,00	June 7	July 9	July 28	A Judson	320 Sansome st
Bald Mountain M Co	California	2	3	June 26	July 27	Aug 30	L Shanaahan	125 First st
Continental C & I Co	California	1	05	May 26	July 5	July 24	W E Greene	309 Montgomery st
Champion M Co	California	12	10	June 4	July 7	July 25	P Wetzel	322 Montgomery st
Eldredge G M Co	California	2	05	June 12	July 7	Aug 3	H Kunz	209 Sansome st
Genesee M Co	California	1	40	June 20	July 30	Aug 22	J Stedtfeld	419 California st
Goodshaw M Co	California	14	10	June 6	July 14	Aug 4	C C Harvey	309 Montgomery st
Gorilla M Co	California	1	10	June 1	July 7	Aug 1	A A Engmist	436 Montgomery st
Hamburg M Co	Nevada	8	25	May 24	July 2	July 24	D A Jennings	401 California st
Homeward-bound M Co	California	1	05	May 29	July 10	July 28	A Bowie	314 Montgomery st
Lima Con M Co	Arizona	6	05	June 11	July 18	Aug 6	R D Hopkins	436 Montgomery st
Morgan M Co	California	9	50	May 28	June 29	July 20	C L Tilden	806 Market st
Pacific M & Reducing Co	California	1	25	June 20	July 25	Aug 15	J W Beviling	413 California st
Roma Union M Co	Nevada	2	02	June 18	Aug 6	Aug 27	F. X Simon	518 Sansome st
San Miguel Con M Co	Mexico	2	1,00	Apr 28	June 4	July 22	C G Brooks	210 Front st
Yaqui M Co	Mexico	1	30	May 24	June 28	July 18	T T Atkinson	337 Pine st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Savage M Co	Nevada	E B Holmes	309 Montgomery st	Annual	July 19
Union Con S M Co	Nevada	J M Buffington	309 Montgomery st	Annual	July 16

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bulwer Con M Co	California	W Willis	309 Montgomery st	05	Apr 12
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	Apr 25
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	June 20
Navajo M Co	Nevada	J W Pew	310 Pine st	25	May 14
Northern Belle M & M Co	Nevada	Wm Willis	309 Montgomery st	50	Apr 16
Silver King M Co	Arizona	J Nash	315 California st	25	June 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	June 12

Table of Highest and Lowest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING June 20.		WEEK ENDING June 27.		WEEK ENDING July 5.		WEEK ENDING July 12.	
Alpha	2.00	2.75	1.75	2.00	1.80	1.50	2 00	
Alta	.60	.70	.45	.60	.50	.75	1.00	
Andes	.60	.75	.55	.60	.45	.50	.45	.50
Albion	....	.35	.35	....	....	.45	.40	.50
Argenta	.20	.30	.15	.20	.10	.15	.05	.10
Atlas	....	....	....	....	....	....	....	....
Belcher	1.35	1.75	1.10	1.20	....	1.15	1 15	1.25
Belcher	....	....	....	....	....	....	....	....
Best & Belcher	4.30	5.25	4.05	4.50	4.05	4.20	4.25	4.45
Bullion	1.05	1.25	.90	.95	....	.75	....	.85
Bushtel	....	....	....	....	....	....	....	....
Belle Isle	.40	.50	.45	.50	....	.50	....	.55
Belle Con	1.00	1.05	.90	1.05	.60	.90	.60	.80
Benton	.5	.10	.05	.15	....	....	....	.25
Bodie Tunnel	....	....	....	....	....	....	....	....
Caledonia	....	.10	.10	....	....	....	....	.05
California	.25	.40	.10	.25	....	....	.10	.15
Challenge	.40	.50	.40	....	....	.50	....	....
Chollar	3.20	3.50	2.75	2.90	3.00	3.85	3.30	3.75
Confidence	2.50	3.20	2.00	2.40	2.10	2.25	2.05	2 25
Con. Imperial	....	.10	.05	.10	....	.10	....	.10
Con. Virginia	.55	.70	.45	.55	....	.45	.40	.50
Crown Point	1.40	1.65	1.25	1.45	1.25	1.30	1.40	1.45
Day	1.00	1.05	.85	.50	....	.55	....	.50
Elko Con	.15	.20	.20	.25	....	....	....	....
Eureka Con	3.10	3.25	5.00	8.00	4.10	5.00	4.75	6.00
Eureka Tunnel	....	.75	.25	.70	....	.40	....	.60
Exchequer	.30	.75	.20	.30	....	.25	.20	.25
Grand Prize	....	.30	.05	.25	.05	.10	....	.05
Gould & Curry	2.70	3.40	2.50	2.70	2.25	2.45	2.40	2.50
Hale & Norcross	6¾	7¾	5.25	7.00	6.00	7.00	5¾	6¾
Holmes	....	....	....	....	....	....	....	....
Independence	.30	.35	.35	1.05	....	....	....	.50
Julia	.10	.15	.10	.15	....	....	....	.15
Justice	....	.30	.15	.20	....	....	.20	.25
Jackson	....	....	....	....	....	....	....	.35
Kentuck	....	....	2 50	....	....	....	....	....
Martin White	....	....	.05	....	....	....	....	.05
Mono	....	....	....	....	....	....	....	....
Mexican	3 10	4.15	2.80	3.05	2 90	3.00	2.90	3.15
Mt. Diablo	3.00	3.25	3.00	3.25	....	....	4.50	6.00
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	....	....	....	....	....	....	....	....
Northern Belle	6.50	6¾	6.50	6¾	6¾	6.75	6¾	7.00
North Noonday	....	....	....	....	....	....	....	....
Navajo	1.85	2 35	2.35	4.20	2.90	3.20	2.40	3.20
North Belle Isle	....	....	....	.50	....	....	....	.30
Occidental	....	2.00	1.65	1.90	....	1.25	....	....
Ophir	2 70	3.40	2.25	2.90	2.25	2.55	2.40	2.65
Overman	.40	.60	.35	.40	....	.30	....	.40
Ore	....	....	....	....	....	....	....	....
Potosi	1.30	1.60	1.25	1.40	1.25	1.40	1.45	1.55
Pinal Con	....	.90	....	.80	....	....	....	.60
Savage	2.40	2.70	1.90	2.30	1.95	2.10	1.95	2.05
Seg. Belcher	....	....	....	....	....	....	....	3.00
Sierra Nevada	4.45	6¾	3.60	4.50	3.55	3.80	3.90	4.15
Silver Hill	....	10	....	.05	....	....	....	....
Silver King	....	10¾	10	10¾	....	10	8.50	9.75
Scorpion	.70	.85	.60	.70	....	....	.60	.70
Tuscarora	....	....	....	....	....	....	....	....
Union Con	4.80	7¾	4.35	5¾	4.40	4.80	4.90	5¾
Utah	2.70	3.75	2.80	4.90	2.75	2.80	2.65	2.85
Ward	....	....	....	....	....	....	....	....
Wales	.25	.30	....	....	....	....	....	....
Yellow Jacket	4.25	4.75	3.60	4 15	3.65	3.50	3.75	4.05

Sales at San Francisco Stock Exchange

THURSDAY A. M., July 12.		50 Argenta	05c
400 Alta	05c	200 Albion	45c
100 Argenta	05c	20 B. & Belcher	4.35
50 Bullion	85c	50 Belcher	1.25
100 B. & Belcher	4.25	250 Benton	25c
500 Benton Con	25c	20 Bodie Con	70c
230 Chollar	3.50@3 55	1485 Chollar	3.40@3.45
200 Crown Point	1.40	40 California	15c
100 California	15c	450 Con. Virginia	45c
10 Confidence	2.05	40 Confidence	2.40
130 Eureka Con	4.50	200 Crown Point	1.40
200 Eureka Tunnel	60c	100 Eureka Con	4.50
120 Gould & Curry	2.55	787 Exchequer	20@25c
100 Hale & Nor	6	580 Gould & Curry	2.40@2.45
50 Kentuck	2.90	1000 Grand Prize	05c
300 Lady Wash	10c	100 Hale & Nor	6¾
70 Mexican	3.10	200 Independence	60c
24 Mt. Diablo	5¾	100 Mexican	3.05@3.10
50 Northern Belle	6¾	70 Mt. Diablo	4¾
50 N. Belle Is	30c	300 Navajo	3.00@3.05
140 Ophir	2.60	10 Northern Belle	6¾
240 Potosi	1.55	140 Ophir	2.55
325 Savage	2.05@2.10	275 Potosi	1.60
765 Sierra Nevada	4.30@4 35	100 Silver King	8¾
25 Utah	2.90	300 Savage	2.05
320 Union	5¾@5¾	755 Sierra Nevada	4.15
500 Yellow Jacket	4.05@4 15	400 Scorpion	65c@70c
AFTERNOON SESSION.		650 Union Con	5¾
1140 Alta	05c@6¼	150 Utah	2.80
100 Andes	55c	35 Yellow Jacket	3.95@4

PAUPER Irish immigrants are coming into the nited States by way of Canada.

Mining Share Market.

Wobbling to the extent of one or two short bits per share, the stock market during the week has held the even tenor of its way. How or by what process life is kept in an institution so nearly inanimate, it is hard to divine. But, we suppose it is, as the poet tells us, because "hope springs eternal in the human breast" and because there are those, as Hudibras says, "who think the pleasure is as great in being cheated as to cheat;" and so between the sanguine and the simple, enough sustenance is contributed to keep the wheels of this juggernaut moving. Touching the condition of the market and the subtle ways of the stock angler, the *Daily Report* of July 12th, holds the following pertinent language: "With the exception of Alta, which is apparently being manipulated for a deal, the market was quiet after the adjournment of the Board yesterday afternoon, and did not look as promising as earlier in the day. A column might be written daily on the variations in prices, the gossip of the street and the hopes and the fears of speculators, and some of our contemporaries do publish that amount of so-called stock matter. But while operations are so light in the market and real facts are not obtainable, it is a fraud on the public to publish elaborate stock articles. Several recent movements in the market have been made with the assistance of mercenary newspapers, and in each case the people, the luckless outsiders, have been fleeced. The manipulation of Union Con., for instance, has been conducted with the aid of one or more newspapers, as every observing operator on the street well knows. We give the news as it comes, state the facts as they are, and are not controlled by bulls or bears."

Bullion Shipments.

Mt. Diablo, June 28th, $9,429; Contention, July 5th, $17,800; Ramshorn, 5th, $15,148; Tintic, 5th, $10,594; Turrill, 5th, $2,269; Ontario, 5th, $4,333; Horn Silver, 5th, $9,000; Ontario, 6th, $8,180; Horn Silver, 6th, $12,000.

OAKLAND BAG FACTORY.—The Oakland *Times* says that the promised revival of the jute mill in East Oakland is under way. The work of cleaning up the looms, of which there are 122, besides other branches of machinery, was commenced last Monday. In addition to this, a new brick building, one story high, with a frontage of eighty-five feet on East Eleventh street, and a depth of sixty feet, to be used as a store-house, will be commenced this week. A large frame addition will be made to the east wing of the main building for the reception of new machinery from the East and San Francisco, amounting to about $3,000, with the addition of a new patent sewing machine of Mr. Kohler, of Oakland. The boilers are to receive an overhauling, a new smokestack, and the addition of a brick wall. The amount of money to be expended in improvements will reach several thousands of dollars. A new system is to be inaugurated in the mills, under the efficient management of Superintendent John Robertson, formerly superintendent of the jute mills at San Quentin. Mr. Robertson offers employment to boys and girls from the ages of ten years and upwards; and favorable chances will be given them to make good wages. Chinese are not wanted, but it is probable that only a few will be employed to do certain grades of work.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

CONSOLIDATED.—*Dispatch*, July 7: The Plymouth, Empire and Pacific mines have been consolidated under the name of the Plymouth Consolidated Gold Mining Company. Capital stock $5,000,000, divided into shares of $50 each.

CLOSED FOR A TIME.—The Scatom company's mill closes down this week, but the company will continue to sink in the old shaft. The mill will probably be stopped for a month or so.

Fresno.

HOPES FOR A BOOM.—*Expositor*, June 30: The news from the mining districts in this county is of an encouraging character, and from all appearances there will soon be a boom here. There are undoubtedly some of the richest mines in the State located in Fresno. All that is required is capital and intelligent energy to develop them.

AT SWEDE GULCH.—The Hawk-eye quartz mill is completed and is running on quartz from the Hawk-eye mine on Swede gulch. The mill runs as smoothly as a watch, and the quartz, we are led to believe, will yield handsomely; this will add more life as well as prosperity to our little burg.

A BIG ENTERPRISE.—Col. Defrees is negotiating with a French Co. for the sale of the Quartz Mountain mine in the sum of $200,000, one of the company, Marcellus Fache, with a mining engineer from France, and other experts from Oakland, were up a few days since looking at the property, and say they find everything as well as they expected. They took samples of ore from various places on the mine and returned to San Francisco to make tests, and if the assays are as good as they think they will be, they will buy the mine and commence work immediately cutting a ditch and building a flume from the south fork of the north fork of the San Joaquin river, a distance of 23 miles, with a capacity of 3,000 inches of water, and erect a 120 stamp mill. This will require an outlay of about $400,000, and if properly done and managed, this will be as good a piece of mining property as any in the State.

Inyo.

GOOD YIELD.—*Independent*, June 30: Messrs. Baker, Barnes and Keyes, of the Elgin mine, were in town during the week with 24¾ ounces of fine retorted gold, the result of working 33¾ tons of ore in their new arastra. Considering that this first run was somewhat experimental, it makes a good showing, especially as the mine looks as though it will supply all the ore they want indefinitely.

Kern.

GOLIC DUST.—*Californian*, July 7: Dr. Donnelly was here last Saturday bringing a large quantity of gold dust from his Oak Tree mine at Long Tom, which he is now engaged in developing. He thinks the district remarkably rich and extensive and that the best mines are yet waiting to be uncovered by fortunate prospectors.

Mono.

MAY LUNDY.—Homer *Index*, June 30: This mine is adding to its reputation as the richest gold mine in California. The ore is not only of a very high grade, but the gold extracted is of much finer quality, and is worth several dollars per ounce more than that taken from any other quartz mine of note in the State. The mine is in excellent condition, the mill is kept going day and night and the bullion shipments are regular and heavy.

BUNKER HILL.—"This is one of the most promising mines at the south end of Tioga district. It is situated about 400 ft west of and parallel to the Golden Crown (of the Mount Gibbs group), and, like many of the mines of that section, runs from carbonate to black sulphuret ore at depth. The shaft, now 26 ft deep, has already passed into a rich black sulphuret of silver, giving assays all the way from a fair milling grade up to $3,300 to the ton.

GORILLA.—Some delay was caused by the non-arrivals of track-iron for the tramway, but it is believed the transportation of ore from the mine to the reduction works will begin to-day. The reduction works have been put in thorough repair, and the mine has been opened on a comprehensive scale and has a large quantity of ore in sight, and a successful run may be expected.

IN BRIEF.—The landslide that carried away a section of the water ditch of the Virginia Creek Hydraulic Co., above Old Mono, caused greater damage and a longer suspension of mining operations than was expected. Wm. L. Callahan, Recorder of Jordan district, and others, left on Saturday last to prospect for placer diggings and quartz in Convict canyon, on the south side of Long valley. Negotiations are in progress for the employment of a large force of men in the placer fields of the Lee Vining Creek Hydraulic Mining Association. A great deal of prospecting and development work is now being carried on in the south end of Tioga and in Prescott district. The Mono Lake Hydraulic Mining Co., is working steadily and washing away a great deal of gravel. The Great Sierra tunnel in Tioga is still idle, awaiting repairs to the machinery.

MEN EMPLOYED.—The following men were employed in the Standard mine during the past week: Ninety miners, 18 carmen, 4 laborers, 3 watchmen, 3 station tenders, 3 firemen, 4 tramwaymen, 3 blacksmith's helpers and 1 woodman, at $4 per day; 2 ore-sorters at $3.50 per day; 3 blacksmiths, 5 engineers, 5 carpenters, 1 ropeman, 1 boiler maker, 3 brakemen and 2 shift bosses at $5 per day; 1 chief engineer, 1 blacksmith, 1 pumpman and 1 carpenter at $6 per day; 1 foreman at $250 per month, and 1 clerk.

STANDARD CON.—Bodie *Free Press*, July 10: During the past week there was extracted and shipped to the mills 1,243 tons of ore. The bullion shipment was valued at $30,883.61. The east crosscut, 1200 level, is in 359 ft; progress during the week, 19 ft, with no change to note in the character of the rock cut through. North drift No. 1, 1000 level, is 215 ft in length, where the vein is 1½ ft wide. South drift No. 2 is in from the main east crosscut 165 ft; progress for the week 13 ft. The vein in the face is 5 ft wide and looks well. Upraise No. 1 from this drift has reached a hight of 50 ft; progress 15 ft. The vein is 4 ft wide. The west crosscut from the north drift, 700 level, has been driven since last report 12 ft, and is in 336 ft. The rock is hard. The south drift from west crosscut No. 1 is in 159 ft; progress for the week 14 ft. The vein is 3 ft wide. South drift No. 2,385 level, is in 639 ft; progress 17 ft; vein 5 ft wide. North drift No. 2 has been extended 248 ft, where the vein is 8 ft in width. The upraise from south drift No. 2 was advanced 14 ft during the past week; total hight 219 ft. At this point the vein is 4 ft wide. Upraise from north drift No. 1 is up 185 ft. The vein is 3 ft wide. The stopes are all looking well.

BULWER CON.—The west crosscut from the north drift, 700 level, was advanced during the week 12 ft, total length 336 ft. The ground is hard. South drift from west crosscut No. 1, 500 level, is in 140 ft; progress 14 ft. There is 2 ft of vein matter in the face.

BODIE TUNNEL.—Work in this mine is progressing favorably. The indications are encouraging. The mill will be started up at no distant day for a protracted run.

SYNDICATE.—Ore extraction continues and the mill is kept fully supplied. There are no particular changes to note.

Nevada.

GOOD YIELD.—*Transcript*, July 4: A clean-up of 11 loads of quartz from the Hartery mine made at Sothern's custom mill, gave $45 per load. This rock was taken as an average from the pile hauled to the mill, of which there are 60 more loads on the ground equally good. The ledge in the Hartery mine is now strong, about four ft in width, and of excellent quality. The mine is being worked by the bondholders, who feel much encouraged by their prospects.

WILL USE WATER.—The example of the Idaho mine, in introducing water power for milling, hoisting and pumping, will be generally followed up by the mining companies of Grass Valley district, judging from the talk of owners but the change will be made gradually.

GOOD FOR PROSPECTORS.—The breaking of the English dam, having swept away the huge boulders and ripped things up generally on the Middle Yuba for many miles below the site of the dam, there will be a fair chance for prospectors to make discoveries of gravel diggings in the bars and channels of the stream. There are many interesting spots along the river just below Milton, which will now, doubtless, be closely examined, provided the piles of boulders that filled the channel have been swept away.

NEW YORK HILL.—Grass Valley *Tidings*, July 10: There is good rock now coming out of the shaft at New York Hill mine. Mr. Barnard McGrath, foreman of the mine, had a box filled with specimen rock, which he showed to our reporter, and the rock was sufficiently valuable to merit a special deposit in the company's vault.

Placer.

DEBRIS DAM.—*Herald*, July 7: E. C. Uren and his son Simon, of Dutch Flat, after carefully examining the channel of Bear river with a view to ascertaining the best site for building on that stream, a retaining dam, have fixed upon a point just above the mouth of Wolf Creek, and north of Auburn. Here the gorge is narrow and the storing capacity afforded by the spreading of the bed above would be very great. A dam at this point 75 ft high would only be about 120 ft long at the top, and as the necessary material is abundant, it could be built at much less cost than at almost any other point on the river. That a dam will be commenced here within a few weeks after he shall have made his report, Mr. Uren seemed to think more than probable. The miners, on the Bear river watershed, including those of Dutch Flat, and those of several smaller mining districts in Nevada county, are working together in this matter, and have in contemplation the erection of a dam this summer of sufficient dimensions at least to demonstrate the practicability of the damming system as a means of protection to the exposed portions of the valley.

THE GOLDEN FLEECE GRAVEL MINE. After tunneling over 2,000 ft the owners of this property have struck a fine prospect of gravel and are now fitting up preparatory to working the mine systematically and extensively. They have just completed a large boarding house, and are going to work on their dump. This mine is located on the Iowa Hill divide about eight miles above Damascus, and gives promise of proving a very valuable property.

San Benito.

SILVER PROSPECTS.—*Advance*, July 6. Silver ore having been found in the San Cabilan mountains and a number of claims located, a mining district called the Phillips, has been formed there, with Porter Phillips as Recorder, a petition has been forwarded for the appointment of F. DeLanza as Deputy Mineral Surveyor. The district adjoins Carr's and Grogan's grants. The prospects are considered very good and who knows but what another Almaden or New Idria may be discovered?

San Bernardino.

BORAX.—*Print*, June 30: Work on the borax claims in East Calico, recently purchased by Coleman & Co., has been progressing ever since the company obtained possession of the property. Several men are employed in taking out borax. The deposits that are being opened up are large and of a high grade. A building 14x40 ft is to be erected on one of the claims in a few days. It is not yet decided how soon reduction works will be built for manufacturing the borax.

BULLION SHIPMENTS.—The bullion output from the Bonanza King mine at Providence last month was $70,000. This month it will be about $65,000. The total yield of bullion from the mine from January 1st to June 1st is $301,451.92. The bullion shipped from the Pioneer and Oriental mills since our last report amounts to $7,373. Mr. M. Carey, superintendent of the Ibex mine, brought in $3,311 worth of bullion from that mine yesterday. About $10,000 in bullion was shipped from the Oro Grande mill this week, being the result of a week's run on Silver King ore. About $6,000 worth of bullion was shipped from the Waterman mine this week.

HOLCOMB VALLEY.—Mr. John Haley, the present owner of the English Co.'s works and quartz mill in Holcomb valley, will soon place the mill in running operation and commence work on his different mining properties in that locality. Owing to a system of "freeze out," these mines have lain idle for a long time, but it is hoped that work will again commence

and the place assume the appearance of a thriving mining camp.

OFF FOR THE PLACERS.—Messrs. Sullivan, White and Henderson have gone out to the placer gold mines at the foot of old Baldy. They are about the San Gabriel and San Antonio gulches and report the prospects booming.

Sierra.

VARIOUS MINING ITEMS.—*Tribune*, July 5: The Bald Mountain Extension Company of Forest City, cleaned up 98 ounces of gold last week as a result of one week's run on gravel taken from the South Fork ground. Van Gerson & Hill recently worked two tons of ore, from their ledge in Slug Canyon, that paid a little over $17 per ton. Indications favor their opening out a good mine. Mr. Lamping is preparing to start up the mill at the Primrose mine in Hog Canyon. This mine yielded a couple of hundred thousand dollars, when it was worked a number of years ago, and there is considerable good milling ore in sight now. Last Monday Dr. Sawyer brought down a fine lot of gold from the 1001 drift mine. It is heavy lead gold. The company employs ten men. Fifty-eight ounces of gold was the result of the last week's washing at the Extension drift mine. The pump has been started up at the Pliocene shaft by the Extension company. They will now have an abundant supply of water for washing gravel. The supply of water is getting a little low at the Ruby drift mine.

NEVADA.

Washoe District.

SUTRO TUNNEL.—*Enterprise*, July 5: During week ending July 1st, repairman have cleaned out debris accumulated during the extension of the new 60 to; also removed old drain boxes, disconnecting 370 ft of pipe lying parallel with the track, relayed some 370 ft of track taken up while cutting drain, placed boxes in drain, put down switch, removed sets of old timbers, put up five new posts and two caps in place of the old ones removed from point 18,-714, and made some slight repairs on boxes in the north lateral tunnel, where 30 ft of drain have been excavated. In shaft No. 2 have turned off fly-wheel preparatory to running engine for hoisting water—also, eased behind timbers of shaft and repaired cage guides. The flow of water is equal to 8,032,700 gallons per 24 hours. The following temperatures were observed: Entrance tunnel, air 112°, water 120°. Osbiston connection, air 100°, water 120°.

THE NORTH-END CROSSCUT.—The joint west crosscut on the 3000 level of the Union and Sierra Nevada mines is still being pushed ahead. The face yesterday showed more water than has yet been found, yet it did not amount to much. As the water did make its appearance in spurting streams, but merely oaked through the rock, it indicates no pressure from above. Some small seams of quartz have been cut, and the greater part of the water appears to come from about these,

HALE AND NORCROSS. *Enterprise*, July 11: The raise from the 2600 level of the Hale and Norcross was last evening up 73 ft. The rock continues dry. On the 2400 level they are now doing nothing. The winze down from that level has been pumped out. The 2500 station and drifts are now dry. The winze below the 2500 level has been pumped out to the depth of 25 ft. As they are now so near connecting and as better progress can be made in working upward than downward, they will not sink in the bottom of the winze. Should they now begin blasting above it would endanger the men in the upraise. The connection will probably be made in five or six days. The winze below the 2600 level was last evening down 55 ft. Next week active operations will be resumed in all the middle mines, as the much-desired air connection will be made the first of the week.

Bernice District.

NEW MILL.—*Reveille*, July 3: Five stamps in the new mill in this district has been started and the dropping of the others will follow in a few days. There is considerable activity among the miners, the mill affording them an opportunity of realizing from their ledges. There is considerable ore accumulated on the dumps of the various mines.

WILL START UP.—The trouble about title to the Brem mine, Midas flat, having been settled, the mill there has resumed operations and the mine will now be worked for all that is in it, and we are confident that it will prove a success.

AFTER MANY YEARS.—The mill at Ophir has been running steadily for several months past turning out regular shipments of bullion. The ore, which is taken from the old dumps, was several years ago thrown away as worthless. Last week a few men were set to work in the mine and they took out several tons of rock that milled $50 per ton. The mill closed down on the 30th ultimo to make necessary repairs but dropped stamps again on the fifth.

WANTED.—A custom mill is badly needed in Union Mining district. Chloriders can take out considerable ore that would pay them well if they could get it worked in the district, but it will not pay to ship to Austin or Salt Lake.

QUARTZ DISCOVERIES.—*Sentinel*, July 6: A quartz lode that promises to pay has lately been found near Wilderville. A quartz vein near Willow springs is being tested. Wm. Griffin, of Wilderville was in town this week. He has found a new quartz ledge in that vicinity recently which he thinks will pay well if the necessary machinery is put on. For the first time water has got so low at A. W. Sturgis' drifting claim on Jackass creek that he has been compelled to suspend for the season. Supt. Ennis of the Sterling mine says water has failed so fast during the warm weather, that cleaning up has commenced considerably earlier than usual. The run was short, but will no doubt prove a good one.

Columbus District.

NORTHERN BELLE.—According to the recent report of this company, about sixty tons of ore are being extracted and sent to the mills daily. Both mills are running steadily and doing good work. The crushing for the Great Western mine has been completed, and mill No. 2 is now engaged entirely upon the company's ore. The bullion shipments amounted to $14,161.25 for the week ending June 28, and aggregate $41,778.09 on June account to the same date.

Eureka District.

EUREKA CON.—*Sentinel*, July 4: The drift from the new shaft is in 15 ft. In a few days Mr. Read, the Superintendent, calculates that from 30 to 40 ft will be made daily, and this may possibly be increased to 50 when drifting has got under full headway. The sump at the bottom of the 1200 level, from which the drift runs, has been all timbered up and finished. There is nothing else in the working of sufficient importance to deserve special mention.

EUREKA TUNNEL.—Gen. Connor states that there is no truth in the story that the Eureka Tunnel is to be worked by tributers. He says he has no idea how such a report could have been started. The mine looks splendid; with the fine ore bodies in sight there can be no reason to think of giving it up to tributers.

Garfield District.

VARIOUS MINES.—*True Fissure*, July 7: The leading mines of this district are looking well. The Atherton is opened by two tunnels, one 300 and one 400 ft in length, in both of which there is a large body of high grade ore exposed, and ready for extraction whenever the owners see fit to get it out for milling. The Great Western is another good property, the best poor man's mine in this district. It has paid steadily from the grass roots down, the ore averaging $250 to the ton. It is all picking ground, not an ounce of powder having ever been used in taking out the ore. The Lancashire is another ore producer, also a poor man's mine. The Henly mine, next in importance, is owned by parties in Dayton, who are working three men. Prospects are fair for developing a good body of ore. The Blue Light copper mine in the southeastern part of the district, has produced several thousand tons of splendid copper ore, but for several months past there has been no work done on it. The John & McDonald mines are lying idle. They have had a checkered career, and from appearance there is no likelihood of any work being done there for some time. Miners seeking employment, better keep away from this place, as there are only twenty-four men working for wages, and no show from the present outlook for times to improve.

Ploche District.

MEADOW VALLEY.—*Sentinel*, June 30: The ore now being extracted from this mine has greatly improved the last week. The miners estimate the improvement at $20 per ton. The company could work the ledge and make it pay a big profit. Fifty or sixty men placed to work in the mine would help out wonderfully these dull times. The lower workings of the Day mine continue to improve as work progresses. A large body of ore is now exposed. May she keep up her lick. A 90-pound bar of bullion was cast last Saturday at the tailing mill at the lower end of town the result of six days' run. The boilers that were first put in the mill leaked so that they had to be taken out, and new ones are now being put in.

Pyramid District.

THE JONES AND KINKEAD. *Reno Gazette*, June 30: The air compressor for this mine, situated near Pyramid Lake, came down to-day from Virginia, and will be taken to the mine to-morrow. After it is set up, sixty days will complete the tunnel. Then the anxious stock-holders will know all.

Safford District.

SHIPPING ORES TO SALT LAKE.—*Express*, July 7: After thorough inquiry we are able to give the necessary information concerning the rates charged for shipping and reducing Safford ores at Salt Lake, which will show clearly the reasons for not being able to work them in this section of the country, or at Eureka, as we had at first suggested. In conversation with Mr. Mather, the manager of the Salt Lake furnaces, who is at present sojourning here, he informs us that he pays the full assay value for all ores, deducting only $12 a ton for working charges and $8.25 for transportation from the dumps to Safford, making $20.25 the total charge for hauling and reducing. Consequently, ore assaying but $26 per ton would net the owners $4.75, making it available and profitable to ship ores of a very low grade. Mr. Mather explains by saying that our ores carry so much iron that they are desirable for smelting Utah ores, which alone would make them worth something, even though they did not carry much silver. In the light of these facts it should induce our miners to develop their properties, as the district abounds in low-grade ores which, under the above rates, can be shipped to Utah at a handsome profit. Ores of a high grade are treated in the same manner, a ton of $300 ore not costing any more to ship and reduce than a ton of an inferior quality. When it is taken into consideration that furnaces in this section pay but 67 per cent of the assay value, besides charging $12 per ton for reduction, not counting the transportation rates, it is not to be wondered at that ores are shipped to Salt Lake city, a distance of nearly 400 miles, and worked cheaper than at home.

Taylor District.

MONITOR MINE.—They have sunk on the ledge 130 ft. There are two ft of ore at the bottom of this shaft that worked an average of over $100. It looks splendid and is going down at an angle of about 66°.

Tuscarora District.

WORKS BURNED.—The hoisting works of the Grand Prize & Argenta company at Tuscarora, were destroyed by fire on the evening of June 29. Sage brush was used in firing up and a spark ignited the pile in the boiler room during the temporary absence of the fireman. On his return the entire room was in a blaze and soon the entire structure was in flames. Al Griffin, the engineer on duty, hoisted over two men who were on the 300 ft level while the roof was blazing. Six men below that level escaped by coming up an old shaft. It will require $30,000 to replace the machinery and structure. Insurance $10,000.

White Pine District.

THE EBERHARDT.—*News*, July 7: We are informed that Capt. Drake, of the Eberhardt tunnel, has had another $100,000 placed at his disposal by his company to carry on the work of exploration in Treasure Hill. He will shortly start up the burleighs again. A persevering company is that same Eberhardt. The Konigsberg mine, is looking finely and promises well for the future. Mr. Jacobson, the owner, is now in Eureka with a shipment of rich ore. The Smoky mill is running steadily. Several of its working force quit this week, owing, it is said, to the unsatisfactory rate of wages paid. The ore teams are making their regular trips from the Hill, and will have all they can do till the season closes.

ARIZONA.

VARIOUS MINES.—Mojave *Miner*, June 30: Work is being actively prosecuted on the Paymaster and New London mines, near Corbat.—The El Dorado near Gold Basin, on the mines near Sherwin's peak, where they are extracting considerable ore—on the mines near Chloride, where they have a four ft ledge of galena ore. Sherman, Smith & Co. will have two or three tons of ore from their new find sampled at the Keystone mill during the coming week. This is free milling ore and the mine being only half a mile from the mill it can be worked there to better advantage than by shipping it. Robert D'Yhr is working on the Oro Fino and has a fine streak of pay ore in sight. Johnny Kennedy and P. Hach have struck water in their shaft on the Black Warrior mine at Stockton. The tunnel on the Eva mine at Stockton is now in 75 ft and is close to the ledge. At the Keystone mine, Globe district, work is now being prosecuted on the 150 level, whence a large quantity of ore is being extracted. At this place the ore vein is some five ft wide averaging probably $90 to the ton. From this level the air shaft is being sunk to connect with the 200 level. It has already been sunk about 20 ft, leaving some 30 ft more to sink before the lower level is reached. When that is done there will be about 30 ft of drifting to be done to connect with the 200 level with the shaft. When all this is done perfect ventilation will be secured for the 200 level. In sinking the shaft two parallel streaks of rich ore have been encountered, each averaging about six inches in width. Samples of the ore from this place assay between $400 and $500, the ore being very rich in ruby and antimonial silver. The Silver King Co. are building an office at the mine. They are sinking the main shaft and are striking for 1000 ft; they are now making a station at 800 ft.

COLORADO.

DIVERS MINES.—*Register-Call*: An assay of ore from the Garfield mine in Lake district, considered to be an average sample of 16 inches of crevice matter, 69 ounces silver per ton. The Garfield is in the same belt of veins as the Mascotte and south of the Williams. The Waterman mill will start up next week on Legal Tender ore. This mine under the Waterman lease, is developing into a first-class property, as the amount and quality of the ore which is being taken out shows up to the utmost satisfaction of both lessors and lessees. The Native Silver mine at Caribou was sold last Saturday to Joseph Lloyd for $8,823.35, and the mill was bid in by Mr. Buckingham for $4,465.03. Both are cheap as dirt. Now the mine and mill should both be started up under practical management. Since work was resumed on the Bull-of-the-Woods the crevice of iron about two inches in thickness, has widened out to over 16 inches of solid mineral, the full width of the crevice matter between walls being over three ft. The mineral is a bluish sulphuret, and prospects well. A mill and smelting run will be made next week. A large number of prospectors are in camp at Hot Sulpher Springs, waiting to get into Carbonate. The bridges are swept away and the streams are too much swollen to ford them. The rich strike recently made at Irwin, in the Gunnison country, proves the remarkable richness of the field around the Forest Queen property. The new discovery is on the north extention of the Forest Queen, has a vein 18 inches in width and was made at the bottom of a shaft 36 ft deep. Mill superintendent Lewis deposited last evening at the First National Bank, this city, 244.39 ounces of gold retort cleaned up from the California Mine Co.'s stamps in Black Hawk. A portion of this came from the Kent county mine, one of the mills of the company have been employed in crushing for the Kent Co, since the accident on the California some days ago. The gold has a currency valuation of $3,509.

IDAHO.

CHANCE TO INVEST.—*World*, July 3: The Elmira Co. have got to the line of the Silver Chief claim, at a depth of 300 ft, and the vein shows up beyond all expectation. This is a grand opening for capitalists—probably the best in the Territory, and it is now held at a very reasonable figure. The Chinese Co. working Sam White's drifting ground on the shares washed up the other day. The clean-up was very good. We don't know the exact figures but it amounted to several thousand dollars. The company has been at work on this run since last November.

ANOTHER RUSH.—There is almost as much excitement 12 miles this way from Sheep mountain as at the latter place, over recent discoveries of an immense free gold quartz district of free milling gold ore, and large numbers of prospectors are now exploring and locating claims there.

GOOD RESULTS.—The recent clean-up at the Elk Horn mill, report says was $8,000, the result of a few weeks' run on Pride of Idaho ore. The mill has only five stamps.

AT PHILLIPSBURG.—The Algonquin mill started up a few days ago on Granite mountain ore, and thus far the results are quite equal to the most sanguine expectations of interested parties. The Hope is not doing so well. Nevertheless, the mill keeps pounding away.

SHEEP MOUNTAIN.—There are now about 100 men in this district and more going in daily. Some good discoveries have been made of rich galena deposits and many claims located.

FROM THE BASIN.—In this locality the Gold Hill Co. is working a force of about 80 men in and about the mine and mill. Developments on the 400 level and in the western extension continue to be satisfactory, and the usual amount of work is being done. This is one of the most remarkable mines on the coast, both as regards permanent richness and skillful management. With mill, hoisting works and every needed facility on the largest scale, yet the company disburse large amounts monthly, and all so quietly as scarcely to give any sign of its existence.

MONTANA.

THE MOULTON.—*Inter-Mountain*, July 8: Everything is looking well at this mine. In the 200 foot west drift, which is being actively forwarded, a very fine vein has been struck which improves as the drift progresses. This drift is on the middle or main ledge. On the 300 foot level on the south vein a winze to the level below has been started which has attained a depth 50 ft showing good ore all the way down. It is at present three ft wide in the bottom and assays by sample $75 per ton. The mill continues well supplied with ore.

DEER LODGE.—The Anaconda smelters will be put up at this place, notwithstanding reports to the contrary. They will also be of much greater capacity than originally projected.

GREGORY. *Inter-Mountain*, July 7: The Gregory mine, deservedly ranks as the richest silver-lead mine on the east side and is only excelled in the Territory by the properties of the Hecla Co. The Gregory is a big mine in any country. It will soon be in order for Butte to ship out a trainload of bullion. Our weekly shipments at present far exceed the Helena consignment in value. If the Lexington, for instance, was to store its product for even six months, it could load a car with bullion of more than four times the value of the Helena shipment because the Lexington is now producing $100,000 per month. Butte is now producing and shipping bullion matter and ore at the rate of $200,000 per week.

NEW MEXICO.

COAL. *Southwest Sentinel*: Some three months ago Pedro Marquez discovered a thin seam of coal on his ranch three miles north of Silver City. Not being able himself to explore the deposit he has since obtained aid from other parties to enable him to do so; the article having been tested with satisfactory results, an incline has been run in on one of the seams which has opened out to a thickness of over four inches at the face of the drift—12 ft from the point where first opened. There is no question as to the character of the coal. It is first-class bituminous and a sack full of it may be seen at Black's planing mill. Further, there can be but little doubt that the seam will open to a width which will insure profitable working—and that Silver City may look for an entire revolution in the matter of fuel.

COPPER DEPOSITS.—But little work is being done now in Hanover district for two reasons: First, the new strike at Fleming drew many of the miners and prospectors to that place; secondly, the copper market has been so low for the past few week, that parties owning copper mines have suspended work, awaiting a rise in that metal. This camp is one of the most promising and best developed in the county. It is a large district, extending over an extensive area of country, and the facilities for cheap mining are unexcelled. Among the more promising claims are the Albion, the James Fair belonging to Hutchison and Shanley; the Iron King and '81, the Contention, the Chamberlain and Bennett group, and the Willis mines. Hutchison and Shanley have two tunnels driven in on the Jim Fair, one 162 ft long, and the other 58. The upper tunnel is being driven through an immense body of good paying copper ore, carrying magnetic iron and white spar—sufficient for fluxing purposes. The '81 is furnishing ore for the smelters at San Jose, and it is said is yielding well. There are large bodies of silver carbonate ore being unearthed in this camp running from $25 to $250 per ton. The district is well watered, good roads leading from there in all directions, and the grading cannot be excelled anywhere. Kingston mines are looming up and the Las Vegas parties who are interested in that flourishing mining camp, will make considerable, from their investments.

OREGON.

NORTH PACIFIC COMPANY.—*Oregonian*, July 7: This company has secured the services of J. L. Hoey an experienced mill man from California, who is busy overhauling their mill preparatory to starting up again and who thinks he can successfully handle this ore. The kinds of base metal in the rock are not many. There is magnetic and manganese iron, some little pyrites of iron and soap stone. The latter is the worst substance the owners have to contend with. It has to be neutralized by some means to warrant success in working the ore. An experienced miner understands the kind of acid that will free the pulp from the effects of the soap stone. The mill has shut down until the new arrangements for better work can be supplied, which will take a week or ten days to get them in place. The gold is in the rock and all that is needed is to work it out and save it. William Elliott returned to the Swank a few days ago from Ingall's creek. He could not do anything there on account of snow. He says he will prosecute his searches in that quarter in about three weeks, when he thinks the snow will have disappeared. Ingall's creek runs through a very deep and narrow canyon, and the divide between Nigger creek and Ingall's is somewhere near 7,000 ft high. Hence the snow at this late period. A piece of gold weighing 23 ounces was picked up in a claim at Pocahontas, eight miles west of Baker City.

UTAH.

TINTIC DISTRICT.—*Tribune*, July 8: The mining outlook here is good, with the exception of the Mammoth property, which is lying idle, not from any fault of the mine, but from bad management. The Eureka mine is turning out about 30 tons of ore per day, which is being shipped to Colorado to be smelted. The Beck is working about 20 men; the property is looking fair, and the output is regular. Messrs. Smith and Martin have taken charge of the Red Bird Con. at Eureka, and are putting in fine steam hoisting works, one of the best yet erected in the district. These men it is supposed have made a good strike in the property. The Park has a concentrator at work. The gangue or waste from this mine is very soft and easily washes away, leaving the concentrates in the form of lead ore very rich in silver. The old Chicago has a good strike on it, lately made in the well defined ledge which runs about 100 ounces in silver. The Northern Spy is supplying the Tintic mill with ore, is doing a good business, and has a steady output. Those interested in Tintic mines are satisfied with the condition of their properties in general, while they regret that the Mammoth is not among the producers of bullion.

ITEMS.—The Germania White Lead Works are turning out their regular quota of lead, and making steady shipments. Preparations are going on at the works for manufacturing various colors of paint, and they expect soon to be able to supply the West with excellent colors. Dry Canyon and Ophir mines are shipping some fine looking ore to the sampling works in this city. The mines of Bingham are sending down their usual quantity of ore, and much active development is going on in that district. The bullion receipts continue to increase, and the mines are reported as looking better in all the leading districts of the Territory.

Metallurgy of Nickel.

We have from time to time recorded the success of the efforts made abroad in the manufacture of pure nickel, and the progress made in securing new applications for it. As foreign experimenters have taken much pains to keep their aspirations and their results before the public, it has been the impression of all but a few who had special opportunity to inform themselves that the credit for the results achieved was due chiefly, if not exclusively, to those who have labored in this field in Germany and in France. It is the merit of Prof. W. P. Blake, of New Haven, to have come forward to correct that opinion; and while giving full credit for good work done by others, he has directed attention to the fact that Mr. Joseph Wharton, of Camden, N. J., was in reality the first to produce pure nickel in a malleable state and in considerable quantities. Professor Blake exhibited a remarkable series of specimens at the Boston meeting of the mining engineers; and from the paper read on that occasion, we take the following interesting data:

Inasmuch as nickel first became known commercially in the industrial arts in the form of an alloy, there were no special attempts to produce the metal in a state of extreme purity. The nickel-silver of commerce answered all the existing demands, and was, of course, much easier to make and cheaper than pure nickel. It found a large and rapidly extending consumption as a substitute for silver spoons and forks, and for silverware generally, especially when the new art of electro-plating was developed by Spencer, Smee, and others. The nickel-silver was specially well adapted to receive and hold the deposit of silver, and it is to this day the most desirable alloy for plating.

The use of nickel alloy for small or subsidiary coins next made an increased demand for nickel. Tentative efforts were made by Dr. Feutchtwanger, in New York, in the year 1837, and he actually issued many one cent and three cent pieces, made of a nickel alloy, the exact composition of which he was careful not to state, but called it "Feuchtwanger's Composition." Switzerland began using nickel alloy coins in 1850; the United States in 1857, though sample coins, one cent pieces, had been made by Prof. James C. Booth, at Philadelphia, in 1853, the prepared alloy containing from five of nickel and ninety-five of copper to as high as thirty of nickel and 70 of copper. The alloy adopted by law consisted of twelve of nickel and eighty-eight of copper. The five cent pieces now in circulation are made of an alloy of twenty-five parts of nickel and seventy-five parts of copper. In 1860, Belgium adopted an alloy of the same proportions, for small coins. Other countries have followed, until the use of nickel alloy for small coins may be said to be almost universal in the chief commercial countries. Up to June 30, 1876, the United States had alone issued of the five cent nickel to the extent of $6,716,129 in value. Another sudden demand for a larger supply of nickel sprang up when the art of depositing nickel by electricity was perfected. The many and increasing applications of this art need not be here enumerated. It is sufficient to state that, at the present time, they constitute a large part of the present consumption of the metal in this country, where the art may be said to have originated in a successful, practical form.

Nickel ore is more generally distributed throughout the mineral-bearing portions of the United States than is generally supposed. It is commonly associated with chrome ores from Canada to Maryland on the Atlantic side, and equally with the chrome ores of the Pacific slope, notably in Oregon. It is also a common associate of magnetic pyrites in the Archæan rocks, being found in Litchfield county, in Connecticut; in the Highlands of the Hudson, in New York and in New Jersey; and specially at Lancaster Gap, in Pennsylvania, where the chief supply of nickel has been obtained for the United States. This ore yields from one and one-half to two per cent. of nickel, but is enriched by smelting at the mine into a matte containing 10 per cent or more of the metal. This locality was worked some 30 years ago by Prof. James C. Booth and others, of Philadelphia and some nickel alloy was made. Some 10 years later, Mr. Joseph Wharton purchased the works and established the industry at Camden, N. J., opposite Philadelphia, where it has since been carried forward.

A large portion of the metal produced at these works by Mr. Wharton, has been used at the United States Mint for the subsidiary small coins, and a considerable amount has been exported. Since the developing of nickeling by galvanism, a large part of the product has been put into the form of nickel salts and anodes.

But Mr. Wharton, not being content with the production of impure nickel, early began experimenting to determine whether nickel could not be produced in a pure and malleable condition, susceptible of being worked in nearly the same manner as iron, and of being applied in the manufacture of various objects, requiring strength of material and a material that cannot be easily oxidized. One of his earliest experiments was to take the somewhat spongy mass got by reduction of the oxide of nickel, and, after heating it to full redness, work it under a steam-hammer into a bar.

In 1873, Mr. Wharton sent to the Vienna Exhibition a sample of nickel in the form of axles and axle-bearings, and at the exhibition in Philadelphia in 1876, he exhibited a remarkable series of objects made of wrought nickel, such as bars, rods, a cube, a horseshoe magnet, and magnetic needles of forged nickel. These did not excite the interest to which they were entitled as a remarkable advance in the working of this little known metal. The exhibit did not cause much comment, and it was not specially described or reported upon, so far as I am aware, except by the judges who reported the exhibit to the Commission as worthy of an award in the following terms: "A fine collection of nickel ores from Lancaster county, Pa., with nickel-matte, metallic nickel in grains and cubes, and manufactured nickel, both cast and wrought; nickel magnets and magnetic needles, cast cobalt, electro-plating with nickel and cobalt, and salts and oxides of both these metals, the whole showing a remarkable degree of progress in their metallurgical treatment."

Some of the same objects formed of wrought nickel were sent over to Paris two years later, and were exhibited in the American section in 1878. There, as in Philadelphia, they did not at first excite any surprise or receive any special attention. Very few persons realized what the objects really were, and that they were very different from alloys of nickel. In fact, very few chemists had ever seen nickel. Pure nickel was a rarity, a curiosity, just as samples of indium or thallium are to-day.

You can then, perhaps, imagine the incredulity of the expert chemists and metallurgists of Europe, when whole ingots and forged bars of metal and numerous finished articles of pure wrought nickel, without alloy, were offered for inspection. These articles not differing greatly in their appearance from the higher grades of nickel alloys, or from electro-nickel objects, they passed them without surprise. No previous exhibition had been so rich in exhibits of the use of nickel and in the products from them. The influx of the pure carbonated and oxidized ores from New Caledonia had greatly stimulated the nickel industry in Europe, and had improved the quality of the alloys of nickel. New companies had been formed to manufacture nickel-silver and to produce nickel from these superior ores at a lower cost than had before been possible. Christofle, of Paris, had just erected extensive works at St. Denis, and had made a most brilliant display of his products in one of the main avenues of the exposition. The Vivians, of Swansea, and other exhibitors, had large cases filled with beautiful objects of hollow and solid ware made of nickel-silver. Amid these various exhibits of striking *tours de force*, the modest little show-case from the United States with examples of manufactures of *pure wrought nickel*, not alloy, could hardly be expected to excite attention and win the golden award, which was most cheerfully accorded as soon as the fact was demonstrated by analysis that the objects were really of the pure metal. Some of the objects now shown were at that exhibition, and have retained their brilliant polish and luster unimpaired. These notable advances in the metallurgy of nickel, made with the lean and sulphuretted ores of Lancaster Gap, prepared the way for greater advances.

Dr Fleitmann, of Iserlohn, Westphalia, Prussia, has improved and cheapened the operation of refining the nickel and toughening it, and has reduced the liability to the presence of blow-holes in castings by adding to the molten charge, in the pot, when ready to pour, a very small quantity of magnesium. This is immediately decomposed, magnesia is formed, and graphite is separated. It would seem that the magnesium decomposes the occluded carbonic oxide, or reduces it to a minimum. The magnesium must be added with great care, and in small portions, as it unites explosively with the charge. It is stirred in. About one ounce of magnesium is sufficient for sixty pounds of nickel. From three-quarters of an ounce to fifty-four pounds of metal have been used with success by Mr. Wharton. The nickel from the ore at Lancaster gap seems not to require as much as the foreign metal. It is to be noted that complete malleability of nickel was obtained at Wharton's works in Camden, before Fleitmann's invention or process, but this last is more rapid and better than the old method. The metal so treated becomes remarkably tough and malleable, and may be rolled into sheets and drawn into wire. Cast plates can be successfully rolled. The cast plates, such as are made for anodes, after reheating, are rolled down to the desired thickness. It is found that it is a great improvement to the nickel anode plates to roll them down. They dissolve with greater uniformity in the bath. Nickel so treated with magnesium has been rolled into sheets as thin as paper. Expensive works for rolling the metal have been erected by Mr. Wharton at Camden. There is already a train of forty-inch rolls, eighteen inches in diameter, with annealing ovens and gas furnaces and their adjuncts, and a ninety horse-power engine. At present, this mill, as well as the works for producing the metal, and the mine also, are "shut down." The largest sheet yet rolled at Camden is seventy-two inches long and twenty-four inches wide, of pure nickel.

Dr. Fleitmann has also succeeded in welding sheet nickel upon iron and upon steel plates, so as to coat them equally on each face with a layer of nickel. The quantity preferred by weight is eight-tenths iron and two-tenths nickel, one-tenth of nickel being placed on each surface. To secure union, the iron or steel must be perfectly flat and clean. A pile is made with outer facings of sheet-iron to protect the nickel from scaling. When the whole is heated to the proper degree, it is passed through the rolls. The two metals become so firmly united that they may afterward be rolled down two or three together, or separately, to the thinness desired.—*Engineering and Mining Journal.*

Mineral Resources of Colombia.

The notes on the Central Provinces of Colombia, recently read before the Geographical Society by Mr. R. B. White, contain a large amount of information interesting not only to the shareholders in the Frontino and Bolivia Company, but to all who have capital embarked in Colombian enterprise.

The State of Antioquia, although it may be generally looked upon as a great table land, is broken up by some very deep valleys. That of the river Arma is 5,000 feet in depth, and marks the line of a great east and west fracture, and the river Porce, which runs in a valley even deeper than the preceding, follows a north and south line. The general elevation of most of the country in Antioquia is 6,000 feet above the sea, and it may be considered as the highlands of this part of Colombia. A great deal of information has been published respecting the lower Atrato, particularly in connection with projected interoceanic canals. The upper portions of this great valley, with their relatively healthy climate and fertile lands, are accessible by steamer from the Atlantic ocean, and can also be easily placed in communication with the interior and more populated parts of Colombia.

At first sight, the enormous trees in these dense forests would lead one to suppose that they must be of immense age; but a comparison with the vegetation which has sprung up on what are undoubtedly

Old Spanish Mine Workings,

Dating no further back than the year 1600, convinces one that the greater part of these forests are not more than 200 or 300 years old, and probably at the time of the Spanish conquest, there must have existed here vast tracts of open country, filled with Indian population, occupying themselves in agriculture and general industry. At present there is only a bad mule track from Onibdo, on the Atrato to Bolivar, but there are no obstacles to the construction of a good road or even of a railroad.

In the northern part of the State of Antioquia

The River Cauca,

Before joining the Magdalena, receives the waters of the Nechi and the Porce. These rivers and the extensive region surrounding their junction are of great interest. Ranges of low hills, dying away in extensive plains, which are not, however, as a rule, swampy, are the characteristics of this district. The climate is hot, but not unhealthy, in the sense in which the term is usually applied to hot and low-lying tropical districts. The lazy negro race of the coast has no tendency to spread inland, and the mountaineer from Antioquia has no liking for a hot climate. The Spaniards found this region was called Zenufana, or "Land of Gold." A great Indian road, probably connecting Bogota, the capital of the Zipa, with the Zenu and Darien kingdoms, and ultimately with Central America, traversed the country. The first Spanish "conquistadores" found immense wealth amongst the Indians, who must have been very numerous. The Indians worked the gold mines, both alluvial and quartz, with which the whole country abounds, and they continued to work them under the direction of the Spaniards. The greater part appear to have been of a low grade of civilization, but the artistic work in gold and pottery which is found in some parts, would seem to indicate that the majority of the tribes were more or less savage tributaries of more advanced races.

The Frontino and Bolivia, and one or two other

English Companies,

Are working gold quartz mines in this region with good results. Other mines, both alluvial and quartz, are worked in a rude way by the natives, and the total produce amounts to about 70,000 ounces per annum. Coal is abundant on the banks of the Nechi and Cauca, and the seams are favorably placed for working. Of the population of the State of Antioquia about 15,000 are professionally engaged in gold mining, and the agricultural produce obtained by the hard labor of the rest of the inhabitants only just suffices for their wants. The Spaniards attempted to colonize this part after having successfully entered the country via the Darien and the Sinu, but their early colonies were destroyed by the Indians, and amongst them the first city of Santa Fe de Antioquia, which was afterwards rebuilt where it now stands.

The Enormous Riches of this Region

Are matters of history. The headwaters of the rivers San Jorge, Sinu, Leon and Rio Sucio run through an elevated country, fertile and healthy. The San Juan valley is to the south province of the Choco what the Atrato is to the north. The region is interesting on account of its vegetable products and the rich alluvial gold deposits of the San Juan basin. In making a journey from Buenaventura up the San Juan to Novita, one meets with no evidences of civilization. The present town of Novita, the capital of the province, is quite modern. The old town, which was about two miles away, was abandoned when the slaves were set free and its rich mines could be no longer worked. The western face of the Torre hill is a horseshoe-shaped amphitheater, which, sloping down in the first place from the head of the mountain for a distance of half a mile or so, terminates in an abrupt precipice; also of a semi-circular form, over which hundreds of streams, which collect their waters on the upper slopes of the hill, fall in silver threads to a sheer depth of over 3,000 feet, and collect together at the bottom, forming the river Surama, whose sources have been previously incorrectly marked as being on the eastern flank of the Torra mountain. Nearly the whole of the distance traversed from Novita, as well as the mountain itself, abounded in auriferous quartz lodes, and the greater part of the streams showed prospects of gold in the alluviums. Much of the country, at an elevation of 3,000 to 4,000 feet above the sea, is healthy and suitable for agriculture, and the schistose rocks, which are its principal characteristic, are not by any means unfavorable to the fertility of the soil. It would be quite practicable to open road communication with the river Tamana, and if sufficient capital were employed an important mining center, assisted by agricultural establishments for the supply of provisions, might here be formed.

A very large proportion of the

Platinum

Produced in the world is obtained from the upper San Juan. If the workings were systematically carried on a much larger quantity might be extracted. Its price in Novita is about 12s. per ounce troy. The bed of the river San Juan and its principal tributaries must contain a large quantity of gold. Concessions have recently been granted for working these rivers, and Mr. White has no doubt that success will attend the operations if properly and practically carried out. The Patia is the only river north of the line, which, after traversing extensive valleys to the east (or inside of) the western cordillera of the Andes, breaks through this mountain range and finds its way to the Pacific.

The strait of Minama is in itself quite a remarkable feature in the Patia valley. The river Patia at this point drains a wide area of country, and receives an abundant supply of water from the snowy ranges of the central Andes; its volume is many times greater than that of the Thames at Richmond. The river, before entering the strait, comes to rest in an immense pool, surrounded by cliffs of slate rock, from which it finds an exit through a cleft which is not more than twelve feet wide, and through which the water moves with a barely perceptible current. This fissure, therefore, must be of great depth. Coal of excellent quality is abundant throughout the upper Patia valley. Copper mines are found near San Pablo. The river Patia itself is rich in gold, and in the dry season the negroes wash out a considerable quantity. The route by which travelers usually enter the country is by way of the port of Barranquilla, at the mouth of the Magdalena river. Steamers run up the river as far as Honda, and at Nare the road to the interior of Antioquia branches off. Five days' journey from Nare on mule back brings the traveler to Medellin, and this route is certainly the right one to follow if the State of Antioquia is to be visited. A railway is in course of construction by Mr. Cisneros from Puerto Berrio on the Magdalena to Medellin, but only about thirty miles have been opened, and the rest of the route is traversed by a mule road about as long as that from Nare. The port of Buenaventura, on the Pacific coast, is called at twice a month by the English steamers from Panama. A good mule road leads from the port to Cali, in the Cauca valley, and a railroad is being constructed also by Mr. Cisneros, following more or less the same line. From Buenaventura to Cordoba, a distance of twelve miles, the railway is now open, and at the latter place mules have to be hired. A day and a half's riding brings one to Cali, and from this city any part of the State of Cauca may be reached by mule roads.

In estimating the practical importance of those districts of Colombia, of which Mr. White's paper treats, it should be borne in mind that Colombia is, with the exception of Chili, the best governed of the South American republics. Property is thoroughly respected, the laws are fairly administered, foreigners are welcomed and protected, and every inducement is held out to attract foreign capital.

CRYSTALLIZATION OF WROUGHT IRON.—A correspondent of *Science* writes: "An iron contractor told me the other day that he was called as an expert in a case where the wrought iron strap of the walking beam of a steamboat broke and injured some one. The broken strap (about four by eight inches, I think,) was shown, and the interior found to be very badly crystallized—the worst case, my friend said, he ever saw. The exterior was of fair, ordinary texture. Afterwards, a part of the strap was cut off, sawn lengthwise into bars, and tested for tensile strength. All portions were rather weak, the highest resistance being but 36,000 pounds, but the inner sections, where the iron was worst crystallized, were the strongest of all."

LONG STEEL PLATES.—Some long steel plates have been rolled by the Otis Iron and Steel company, of Cleveland, Ohio. The plates were 50 feet 6 inches in length when sheared, 51 inches wide in the center, and three-eighths of an inch thick, and the ingots from which they were rolled weighed 4,400 pounds each. They will be used in the construction of a large traveling crane.

THE ENGINEER.

Underground Wires.

Postmaster-General Fawcett, of England, in dwelling upon the advances made in underground telegraphy by his department, states that within a radius of any four miles of the general postoffices there are 4,388 miles of wire under ground and only 500 above ground. The same district also contains about 600 miles of underground private wires. There are thus nearly 5,000 miles of buried wires within the small area described by a four-mile radius from the London postoffice, and not one of these systems is said to interfere with another. The local telegraph system of London is probably the best in the world, and its excellence is largely due to the complete insulation of the wires. The loss from leakage is nominal, and there is no danger of interruption by the breaking of wires which, in certain localities, may at any moment be caused by a fire or by the formation of enormous icicles dragging the wires to the ground by their weight. It would appear from this that American companies are now deprived of their last refuge or excuse for filling the streets and covering the housetops with poles and wires, and i is to be hoped that measures will be taken in the near future with the view of compelling the laying of all wires in cities under ground.

It may be of interest to state that a number of men are now employed in the construction of the underground connection between Marseilles and Paris. The cable is enclosed in a cast iron pipe which is laid nearly six feet below the surface of the ground, and which, at intervals of 550 yards, is provided with cast iron boxes. The latter are so constructed that they can be readily inspected when required, thus presenting no very great difficulty in case of repairs. The cost of the whole work is estimated at about $8,000,000.

THE SUEZ CANAL.—The announcement of M. de Lesseps that he will soon commence a second canal, a return line, close to the existing route, and that all the capital, 125,000,000 francs, has been subscribed by Frenchmen, does not meet what England demands, representation in a canal, claimed to be international, not French, for herself and other maritime powers, pro rata, to their shipping passing through. In the management of the present canal, composed of thirty-three members, all are French, save three Englishmen, who are there by toleration, not by right. All the functionaries are French, and all are at the nod and beck of M. de Lesseps. The canal dispute seems to be settling down into an anti-English question, as a means of thwarting John Bull for not dividing his Egyptian gains with monsieur, who had backed out of the risks. In the administration of the existing as well as in the execution of the second canal, the watchword seems to be: "Exclude the English—the nation who holds nearly one-half of the stock and supplies by her shipping the four-fifths of the receipts."

NEW TERMS IN ELECTRIC ENGINEERING.—In following the development of electric engineering, all the world is learning new terms and new language. Words which three years ago either did not exist, or were understood only by men of science, are to-day in the common language of engineers and their workmen, to-morrow will be used by the general public. "Electro-motive force" and "current," "volts" and "amperes," are becoming terms as well known as "pressure of water" or "cubic feet of gas;" and it is necessary that this should be so, as the time is fast approaching when the public will find their quarterly bills for the supply of electricity made out in "volts" and "amperes," and will have a right to sue their local electric company if their daily supply of "current" is insufficient, or is given at a wrong "electro-motive force."

How to propel trains in tunnels is one of the mechanical or engineering problems of the day for which no very successful answer has yet been found. Ventillation even in short tunnels is exceedingly bad, and in our climate the products of combustion make the air almost stifling in certain conditions of the weather. Any method of storing power which would not occupy more space or weight than an engine and boilers, and would be able to run for eight or ten hours continuously, would be one of the most valuable inventions of the age. Even the storage battery, which entails a loss of at least fifty per cent, could be made immensely useful if it were possible to charge the battery repeatedly without injury to it.

THE GREAT NEW YORK BRIDGE, recently opened between that city and Brooklyn, is not only the largest, all things considered, but also the most expensive structure of the kind ever built. The tubular iron Victoria bridge at Montreal cost $7,000,000. The iron and steel bridge at St. Louis cost $9,000,000. The bridge from England to the Isle of Man, of tubular iron, cost about $3,000,000. There is not a stone bridge in London or Paris which cost over $4,000,000. The bridge at Omaha cost $2,000,000; the one at Bismarck the same sum. The New York and Brooklyn bridge cost about $15,000,000.

USEFUL INFORMATION.

NERVE ACTION.—Very delicate experiments have been made to determine the so-called "reaction time" in sensation—that is the time between the moment of excitation of the senses and the moment at which the person indicates by a signal that he has become conscious of the sensation. Mr. Beaunis, of Nancy, France, has recently sought to measure the reaction time for smell, or to tell how long it takes to realize the sensation of smell after the excitant of that sense has been applied to the olefactory nerves. He gives in *Comptes Rendus* a table of the numbers obtained with ten different substances. They range from thirty to seven hundredths of a second for ammonia, and forty-six for acetic acid, to sixty-three for mint, and sixty-seven for carbolic acid. In the case of musk, he was unable (notwithstanding repeated attempts) to fix precisely the moment of the smell sensation. The numbers given show that the reaction time for smelling is longer than that for touch, sight and hearing. (In the author's own case, it is shorter than for touch.) Dr. Buccola, of Turin, has recently made experiments on smell, with different apparatus, and gets results which agree in the main with those of M. Beaunis.

TURKISH CARPETS.—It may startle some of our readers to learn that "real" Turkish carpets have been made in Germany for Turkey, but such is the fact, at least if we correct the expression "Turkey," by explaining that their destination is the late Turkish province and present kingdom of Roumania. The German element predominating at that Court, the carpets for a new summer palace, Sinai, have been ordered from a Saxon firm, who for some time past have been making imitation Turkey carpets. The designs were submitted to and selected by their Roumanian Majesties, and are said to be of great splendor. One small carpet for a boudoir is in the now fashionable terra-cotta; another, 60 square yards large, for a bedroom, has a cream ground with steel blue border; while a third, 80 square yards large, and weighing 500 pounds, has a red ground with sage border, with a mixture of other colors. This sounds like carrying coals to Newcastle, but the price has no doubt decided the matter.

TO RESTORE MUSTY FLOUR.—A correspondent of *The Miller* seeks information on the above subject, and receives the following reply: We do not believe on principle in adding any foreign substance to flour, and would not advise any one to, but if our correspondent wishes to experiment, we submit the following opinion, obtained from a well informed and reliable man: "Musty flour can be restored and improved by adding three parts of carbonate of magnesia to 760 parts of flour, mixing thoroughly. Carbonate of magnesia cannot be called an adulterant. It has been specially recommended by Professor Davy, on the ground that it improves the color of new and inferior flour, and increases the yield. Dr. Hassell, however, criticises this by saying that 'neither of these results, as far as the public are concerned, are in the least desirable. The increased yield simply means more water.' Even so, if it is an improvement, it should be used by all means."

ROOFING LINEN.—A new covering material, called "roofing linen," has recently been introduced in Germany, which is about the thickness of common pasteboard, and consists of a layer of coarse linen between two layers of thin roll-paper. The cohesion of the three layers is effected by an asphalt composition of special make, called "roofing paint." It is stated that this paint should be freely applied to roofs immediately after their completion, and again about six weeks afterwards. This operation should, it would seem, be repeated every few years. The linen costs about 10d. to 11d. per square yard, and the paint 10s. to 11s. per cwt. Although this new method appears to have points which deserve commendation, a real estimate of its value cannot be formed until the material has been exposed to the test of several years' use.

SOMETHING ABOUT GLUCOSE.—A bushel of corn weighing fifty-six pounds will yield between twenty-eight and thirty pounds of glucose or grape sugar, and in adulterating sugar from eighteen to twenty per cent of the grape sugar is generally used. In Europe potatoes are generally used for the manufacture of glucose, and the manufacturers find larger profits than from corn. A plant called manioc, a native of South and Central America, is said to produce fifty-six pounds of glucose to the bushel. As this plant yields over 500 bushels per acre, it is not improbable that manioc may be the "sugar cane" of the future. The so-called Brazilian arrow root and tapioca of commerce is made from the cassava or manioc plant.

GOOD LEATHER POLISH.—A German journal gives the following leather polish: Mix 200 parts of shellac with 1,000 of spirit—95 per cent—in a well stoppered bottle. Keep in a warm place for two or three days, shaking frequently. Separately dissolve 25 parts of Marseilles soap in 375 of warm spirit—25 per cent—and to the solution add 40 of glycerine. Shake well and mix with the shellac solution. To the mixture add five parts of nigrossin dissolved in 125 of spirit. Well close the vessel and shake energetically, and then leave the mixture in a warm place for a fortnight.

COPPER OR IRON FOR BREWING COPPERS.—According to the *Engineer* (London) there is a strong prejudice in England against the use of any metal but copper in the construction of brewing coppers. On the continent they are often made of iron. It is thought by some that the use of the latter is liable to impart a dark color to the worts, but such, says the *Engineer*, is not the case, for the tannic acid of the hops at once forms a coating of insoluble tannate of iron, which protects the metal from oxidation, and analyses made of worts boiled in iron prove that they do not contain more iron than worts boiled in copper vessels contain of copper; in fact, says the *Brewers' Guardian*, unless copper is kept absolutely clean, it soon corrodes and dissolves to an appreciable extent in a slightly acid fluid like beer wort.

A LOST ART DISCOVERED (?).—A technical exchange says: The art of making Vasa Murrhina, the famous glass work of Egyptian or Tyrian origin, which was lost for 2,000 years, has at last been discovered, and this glass is now being made and introduced as centers for decoration and for panels, tiles, etc. In the restoration of this lost art, we have a decorating material which, from its adaptability and beauty will be much sought for. This revival, which commenced at Murara, has spread to this country, and it is understood that a factory for the manufacture of this glass is to be started in Chicago.

BRICK OF CORK.—At the Nuremberg exhibition was shown a novel use of bricks of corks. These bricks have only been used for building purposes on account of their lightness and isolating properties, but they are also employed as a covering for boilers, and are said to excel even asbestos in preventing the radiation of heat. They are stated to be very cheap, being prepared of small corks, refuse and isolating cement. At Nuremberg, the application of cork bricks was largely shown. The usual size of cork bricks is $10x4\frac{1}{2}x2\frac{1}{2}$ inches.

ASPHALT BRICKS.—Bricks impregnated at a high temperature with asphalt are being successfully used in Berlin for street pavement. By driving out the air and water the bricks will take up fifteen or twenty per cent of bitumen, and the porous, brittle material becomes durable and elastic under pressure. The bricks are then put endways on beton bed and with hot tar. The pavement has been laid down in a part of a thoroughfare where neither granite nor compressed asphalt had hitherto withstood the wear.

GOOD HEALTH.

One Cause of Railroad Accidents.

The most carefully compiled statistics inform us that about 1,400 railroad employes are killed in this country every year, and from 8,000 to to 10,000 more or less injured. This great sacrifice of human life is not, as might at first thought be surmised, caused principally by the frequent collisions or derailment of trains, but by accidents in making up and handling trains at stations. The loss is nearly all confined to brakemen or station train helpers; and the opinion is expressed by good railroad authority, that a very large portion of these accidents might be avoided by improved, or rather uniform methods of constructing cars.

It is a very general impression that system and uniformity is the prevailing rule in that portion of practical mechanics, which relates to car construction, but such is not the fact. From a circular issued by the secretary of the Master Car Builders' Association it appears that the very opposite of uniformity is the rule among car builders for railroad companies. The master car builder of the Boston and Albany railroad says he has forty different kinds of brake heads and shoes, eleven of journal boxes, thirty-seven journal bearings, ten cast iron and five or six wrought iron draw bars, eight or ten different draw bar side castings, and a multitude of various other different parts of a car. The master car builder of the Baltimore and Ohio road reports sixty-five different kinds of journal bearings, and in eleven other articles in common use varieties numbering from twenty-five to six. And similar reports have been sent from other railroad authorities.

This is a singular exhibit, and it would seem almost that human perversity and not mere chance, or individual convenience, had produced this wide and confusing diversity of construction. It is a matter which may well challenge careful inquiry, not only of the association referred to, but of the general public as well.

TRICHINÆ.—J. E. Morris, M. D., in the *Clinical Brief*, says, in regard to trichinæ in swine, that it is a well established fact that the real source of infection in swine lies entirely in the rat. A committee of Vienna physicians found in Moravia thirty-seven per cent of rats examined trichinous; in Vienna and its environs ten per cent, and in Lower Austria about four per cent. The well known voracity of the hog, and its special fondness for meat, cause it to feed upon the flesh and excrements of other animals infested with these parasites, and especially rats and mice. To prevent trichinous swine it is highly important to cut off all the sources of disease in the diet of these animals.

Power of the Imagination.

That imagination may prove fatal, receives fresh proof from "a case of fatal shock from supposed snake bite," reported in the *Medical Press*, April 25, 1883, by Dr. C. R. Francis. The patient, awakened from his sleep by something creeping over his naked legs, immediately jumped to the conclusion that it was a cobra, went into a state of collapse and died, though it was discovered, even before death, that the supposed cobra was a harmless lizard. There is no doubt but that a very large portion of the sickness and death of adults might be warded off by a proper and determined exercise of the will power.

A late number of *Hall's Journal of Health*, in dwelling upon this subject, remarks as follows: To regain or recover health, persons should be relieved from all anxiety concerning diseases. The mind has power over the body. For a person to think he has a disease will often produce that disease. This we see effected when the mind is intensely concentrated upon the disease of another. It is found in the hospital that surgeons and physicians who make a specialty of certain diseases are liable to die of it themselves, and the mental power is so great that sometimes people die of diseases which they only have in imagination. We have seen a person seasick in anticipation of a voyage before reaching the vessel. We have known a person to die of cancer in the stomach when he had no cancer or any other mortal disease. A blindfolded man slightly pricked in the arm, has fainted and died from believing that he was bleeding to death. Therefore, well persons, to remain well, should be cheerful and happy, and sick persons should have their attention drawn as much as possible from themselves. It is by their faith men are saved, and it is by their faith that men die. If he wills not to die, he can often live in spite of disease, and if he has little or no attachment for life, he will slip away as easily as a child will fall asleep. Men live by their souls and not by their bodies. Their bodies have no life by themselves; they are only resources of life—tenements of their souls. The will has much to do in continuing the physical occupancy or giving it up.

The Nature of Consumption.

If a green bush is pulled up by the roots, and these roots are cut off close to the body of the bush, a good general idea may be had of the "air passages," if the bush is turned upside down, or the top to the earth. The end of the bush next to the ground will then represent the part of the throat where the voice organs are, the body of the bush the windpipe, the branches the bronchial tubes, and the leaves the lungs themselves; and as the leaves cover the branches from sight, so the lungs, which are nothing more than little bladders distended with air, hide the bronchial tubes. Here, then, are four distinct parts of a great apparatus, each different in locality, and each locality the subject of a distinct disease, requiring different remedies and a different treatment. Liquid guano destroys the leaf, but gives life to the roots. Water does but little good if thrown over a tree, but saves it from dying if thrown on the ground about it. So what would benefit one part of the air passage might be wholly unavailing if applied to another part. What would cure a disease of the windpipe might destroy the lungs, or be perfectly useless. Thus showing how important it is to know certainly what the disease is, and where it is located, in reference to the great fountain of life, the breathing apparatus.—*Journal of Health.*

HEREDITARY DISEASE.—There is, strictly speaking, no such thing as hereditary disease. Children are not born diseased, however (some specific maladies excepted) much one or both parents are, but they are simply born with a *predisposition* to such parental malady. They are born with the material, with the producing cause, perhaps, but actual disease will no more occur unless exciting causes are applied, than powder would detonate without the aid of fire. The observant reader has often felt surprised at seeing robust, hearty children, of parents who were seemingly at not a great remove from the grave, and if rational care were taken of such children they would live to become healthy men and women. The practical lesson should be a hopeful diligence in the rearing of children of diseased parentage. The difference between the children of healthy and diseased parents amounts to this: As to the latter, they have less capability of resisting the causes of disease, the consequence is a greater necessity for carefulness; this necessity is often felt, and practically attended to; the result is, that such persons are found living, scores of years after those have moldered in the grave, who, in priding themselves on having constitutions which nothing could hurt, could not be made to feel the need of carefulness, and, consequently, perished long before their prime.

A RECENT cough will almost always yield to the following treatment within two or three days: Mix in a bottle four ounces of glycerine, two ounces of alcohol, two ounces of water, two grains of morphine. Shake well. Dose for an adult, one to two teaspoonfuls every two or three hours. Half this quantity to children from ten to fifteen years. It is not safe to give it to infants or children under ten years of age.

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SAN FRANCISCO:
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Passing Events.

Save only such ordinary happenings as occur always and in every country, we have little of interest to place on record of the current week. On the credit side of the business ledger we have to enter many items, such as an active trade, a healthy labor market, favorable weather for maturing and gathering the great harvests of fruit and grain, good prices for our leading staples, uninterrupted public health, and a general prosperity. On the debtor side there is some little shortage of water in the mines, some shrinkage of the crops, a breath of political unrest, with the usual number of accidents, disasters and misbaps to put down. Exempt from the tornadoes, floods, pestilence, drought, and the thousand other discomforting and death-dealing agencies that afflict other peoples, we of California pursue our vocations under halcyon skies, with little to disturb or make us afraid. Multitudes of strangers are this summer visiting our State, a far larger number than ever before; the most of them coming not more to view our scenery and enjoy our climate than to escape the miseries and dangers to which they would be exposed were they to remain at home. These people travel a long way and expend much money for the sake of seeing and briefly enjoying what with us are matters of everyday life. Truly, we are in some respects a favored people.

MORE than 3,000 persons have perished by disasters on sea and land the present year.

"How Shall We Make Bricks Without Straw?"

When, in the course of weekly events, it becomes necessary for us to make up the mining summary for this paper, we sometimes experience not a little trouble in accomplishing that task. In preparing this summary we depend, as will be seen, wholly on our exchanges from the mining districts for the material wherewith to make up the same. Now, so it is, these exchanges come to us sometimes quite barren of items adapted to our purpose, leaving us no alternative but to omit from our columns any notice of mines and mining affairs in that particular locality. This is a damage to the section of country so ignored and a disappointment to us. We might, it is true, adopting the plan of some eastern journalists, draw on our imagination for matter descriptive of these mines, and so furnish to the world some entertaining reading: might reproduce, for example, and further embellish the pleasing fiction lately promulgated in that quarter about two of our noted mining magnates, John P. Jones and Alvinza Hayward—relating how the latter, while engaged in developing a gold mine, having exhausted his means, applied to Jones for assistance; whereupon something like the following colloquy took place: Jones, *loquitur*—"Well, yes, I would like to help you out, my boy, only I am myself about strapped, cleaned-out and done for; only got a little dab cached there under the hearth—not more than a million dollars or so, but you are welcome to that if it will do you any good." "Any good! well, I should rather say! But, then, I don't like to rob you of your bottom dollar and leave you tectotally dead-broke and essentially gone in." "Oh! take it old fellow—take it and pitch in. If you make a strike, good for you. If you lose it, dang the difference. Always like to 'grub-stake' an old friend when I have it in my power." *Sequel:* Alvinza, who is a hopeful, persevering chap, resumes work, strikes a bonanza of a hundred millions or more, all solid gold, which he hastens to share with his liberal friend. Jones, considering this an imputation on his generosity, rejects the offer, whereupon a duel ensues, and both parties are killed. The above account of this sad affair differs, we admit, somewhat from that given in the East. But our version is the better of the two, in that it is more highly flavored, while it adheres equally close to the facts of the case.

This, as we said, might furnish a bit of entertaining reading, at least to that class of persons abroad who have come to relish any kind of lollypop ladled out to them by Bret Harte, Sam Clemens and other writers of the sensational and Munchausen school; but its publication would hardly be fulfilling the mission of the PRESS, which is to furnish the largest amount of trustworthy information possible, in relation to the mines on this coast.

With the exception noted, these our brethren of the press do constantly much good service of one kind and another. They guard vigilantly many public interests—no week being suffered to pass but they make occasion to cudgel the bloated aristocrat, take a whack at the pauper immigrant, or go for the hated mongol in our midst. Save in the particulars mentioned, these papers do not lack variety. They discourse of all things under the sun and on it—sacred and profane, wise and otherwise. They hold forth on the origin and descent of man; give us dissertations on physical improvement, morals, politics and religion; talk about love, free and platonic, and, diving deep into the abyss of metaphysics, drag thence the most abstruse questions and subject them to a hebdomadal airing.

Now protoplasm is good, and so is muscular christianity, which latter the border clergy might, perhaps, practice to advantage, seeing a set-to with gloves might sometimes draw where pulpit eloquence fails. There is virtue in all these things, but in this age we cannot get along without the mining items. We yearn for these. Our desire is of the precious metals, mines, quartz-mills, smelters, etc. We would know how much bullion, and no more, John Smith has taken out the past week or month, as the case may be. Though often told, we like to hear the story rehearsed of the Copper Gong, the Golden Harp and the Silver Lyre. (Let the compositor be careful to spell this last word right.)

Along about the occurrence of our national holiday we did not expect much mining news through these our usual channels of information. But now that the "Fourth of Independence" is past, the crisis over, and the country safe, we indulge the hope that our cotemporaries in the mineral regions will make amends for former shortcomings; even those in the past most remiss managing to slip into their columns every week or two a few lines about the mines, the miners, the millmen, and the smelters in their vicinage. How, without the aid of these, our friends in the upper country, can we ourselves get out a good paper? How, adopting the langnage of the ancient Israelite, shall we be able to make bricks without straw?

The Deer Law.

Effort was made by the last Legislature to guard against the slaughter of the deer for their hides which has been pursued heretofore in a most wanton manner in some of the northern counties. Scores of carcasses have been reported abandoned and the slayers have pressed onward on their murderous course. It is to be hoped that the present law, aiming to prevent such outrages, will prove effective.

It will he well for the information of all who contemplate deer hunting to publish the law as it stands at present, to wit:

626 * * * Every person who, between the first day in November in each year and the first day of July in the following year, hunts, pursues, takes, kills or destroys any male deer or buck is guilty of a misdemeanor. Any person in the State of California, who has in his possession any hides or skins of any deer, elk or antelope or mountain sheep, killed between the first of November and the first of July is guilty of a misdemeanor. Every person who shall at any time in the State of California, hunt, pursue, take, kill or destroy any spotted fawn is guilty of a misdemeanor. Every person who shall take, kill or destroy any of the animals mentioned in this section at any time unless the carcass of such animal is used or preserved by the person taking or slaying it, or is sold for food, is guilty of a misdemeanor. Every person who shall buy, sell, offer for sale, transport, or have in his possession any deer from which evidence of sex has been removed or any of the aforesaid game at any time when it is unlawful to kill the same, as provided by this and subsequent sections, is guilty of a misdemeanor.

Mining Gold Nuggets.

From the Banghart mine, situate twelve miles northwest of Shasta, there was brought to this city last week a lot of gold, consisting of nuggets, weighing each a pound or more. This gold, which occurs in a crystallized form, is met with in bunches, connected by vein matter. It is broken from the containing gangue, with hammers, very little of the ore here being subjected to mill process, what is so treated being worked in arrastres. The most of the gold occurring so at intervals, renders production somewhat irregular, though, in the long run, exceedingly profitable. This mine has been worked for the past twenty years, and has yielded large annual returns. As the gold bearing formation runs clear through the mountain, it is thought profitable operations may be kept up here for an indefinite period. The mine is being worked after a manner that ought to have large following, the management being noted for economy, system, and efficiency. Mr. F. M. Stocking, the superintendent, is a careful and experienced miner, and withal a man of the greatest probity, a very important qualification in the conduct of a property like this.

Production of Precious Metals in California in 1882.*

This State has maintained the second place in the list of gold and silver-producing States and Territories. There was, however, a diminution in the yield of the precious metals of about $1,300,000 from the production of 1881.

This was largely due to a falling off of upwards of $900,000 in the production of the Standard Consolidated mine at Bodie. The gravel mines, too, yielded less, as they had not recovered from the depressing effects of litigation on the debris question, which at one time threatened not only to cripple the operations of some of the chief producing mines, but in some instances to cause a total suspension.

In sections of country where suits were pending, capital was withheld from engaging in new mining enterprises, and even the quartz mines were affected to some extent.

In the southern part of the State more activity was manifested than for some years past. Old mines were reopened and prospecting systematically conducted, with the result of discoveries of importance being made.

During the year the following dividends were paid by California companies:

COMPANIES.	Dividends.	Amounts.
Black Bear Quartz	4	$31,500
Bodie Consolidated	4	100,000
Bulwer Consolidated	12	120,000
Fresno Enterprise	1	10,000
Great Western Quicksilver	1	12,500
Idaho	12	224,750
Marguerite	1	6,250
Napa Consolidated Quicksilver	9	90,000
New York Hill	2	20,000
Pleasant Valley	6	30,000
Plumas-Eureka	2	50,800
San Francisco Copper	6	15,000
Sierra Buttes	2	14,100
Standard Consolidated	13	725,000
Totals	75	$1,449,000

This is nearly $400,000 less than was paid in seventy-two dividends in 1881.

Sixty-eight mines in fourteen counties are reported to have levied 121 assessments, and called upon the stockholders for $1,547,467, as against $2,237,850 in 1881.

I have estimated the total production of the State at $17,645,000, of which 16,800,000 is gold and $845,000 silver. This was produced by the several counties approximately as follows:

COUNTIES.	Gold.	Silver.	Total.
Alpine	$20,000	$10,000	$30,000
Amador	1,500,000		1,500,000
Butte	650,000		650,000
Calaveras	670,000		670,000
Colusa	3,000		3,000
Del Norte	80,000		80,000
El Dorado	600,000		600,000
Fresno	80,000		80,000
Humboldt	100,000		100,000
Inyo	220,000	130,000	350,000
Kern	260,000	20,000	280,000
Lassen	100,000	20,000	120,000
Los Angeles	17,000	24,000	41,000
Mariposa	250,000	4,000	254,000
Merced	10,000		10,000
Mono	2,200,000	380,000	2,580,000
Nevada	3,500,000	10,000	3,510,000
Placer	800,000		800,000
Plumas	1,250,000		1,250,000
Sacramento	400,000		400,000
San Bernardino	20,000	150,000	170,000
San Diego	100,000		100,000
San Luis Obispo	5,000		5,000
Shasta	300,000	80,000	380,000
Sierra	1,100,000		1,100,000
Siskiyou	720,000		720,000
Stanislaus	80,000	15,000	95,000
Tehama	10,000		10,000
Trinity	600,000		600,000
Tulare	5,000	2,000	7,000
Tuolumne	400,000		400,000
Yuba	750,000		750,000
Totals	$16,800,000	$845,000	$17,645,000

This estimate of the gold product of California in 1882 is nearly $1,500,000 higher than the estimate of statisticians on the Pacific coast; but after a careful revision of the reports from mines and districts, and of the statements of the amount and sources of the gold received at the San Francisco and Carson mints, I am constrained to adhere to the figures I have given.

The value of the gold coined at these mints during the year was $29,929,525, of which $2,441,956 was gold bullion belonging to the Government in those mints at the beginning of the year in excess of the amount at its close, leaving $27,487,559 coined from bullion deposited during the year.

Of the latter, $26,431 was United States gold coin, old plate, jewelry, etc., and $4,504,004 foreign gold coin and bullion. Assuming that all of the foreign gold coin and bullion imported during the year at San Francisco, amounting to $4,748,766, came to the mints and was also made into coin, there would remain $22,712,306 gold of domestic production used in the coinage, which must have been deposited at the San Francisco and the Carson mints from the States and Territories sending their bullion to these mints. From the mint records and the reports from private refiners, it appears that all of the domestic bullion received at San Francisco and Carson, except $81,776, came from the Pacific States and Territories, *i. e.*, California, Nevada, Oregon, Alaska, Arizona, Idaho, and Washington, and that these States and Territories sent to the Atlantic coast, also, gold bullion to the amount of $612,524. It is evident, therefore, that the production of the Pacific States and Territories should equal the gold bullion used in coinage that must have been received from them—$22,630,540—and the amount they sent to the Atlantic seaboard—$612,524—a total of $23,243,064. Their total production as estimated in the general table, is placed at $22,570,000, showing, if the official records are to be relied upon, that more than one-half million dollars of gold bullion was delivered at San Francisco and Carson from the Territories bordering upon the Pacific States and Territories; or that the total production of the latter during the year must have been greater, rather than less, than the amount I have credited to them.

*This statement of the production of precious metals in California is from an advance sheet of the Report of H. C. Burchard, Director of the U. S. Mint, for the year 1882.

DURABILITY OF BUILDING STONE.—To determine the value of building stone, some one grimly suggests that a meditation among the tombs is a very good thing, and a capital article on the "life" of stone used for public or private structures could not fail to be written upon what might be observed in humble village graveyards or splendid city cemeteries. In far fewer years than most people imagine, monuments erected to last to the resurrection are in ruins—before the grandsons of "the poor inhabitants below" are dead. Nature will allow just as little waste material as she can help.

THE American railroad interests in Mexico, have all been consolidated.

A New Governor.

An invention relative to steam engine governors has been made by F. Ball, of the Ball Engine Co., of Erie, Pa., which introduces what will strike most of our readers as an entirely new principle, or theory for their action. The Ball governor, instead of depending on variations in the speed of the engine for securing a general uniformity, takes an entirely new departure, and makes the variations in the load the means for regulating the speed. It is generally admitted that the theory of an engine governor of the ordinary type is defective. These governors only act when the speed changes, and, although the best of them act within exceedingly small limits, there must be certain irregularities of motion in order that they may act at all. Theoretically, the ordinary governors cannot keep an engine at a uniform speed under wide changes of load. They act only within certain limits, which are largely a matter of adjustment. Usually, if the governor is very sensitive to changes of speed, it will be unstable in its action, causing an intermittent flow of steam to the engine, if it is a throttling governor, or irregular cutting off if it is a cut off governor. It will be always "hunting," as the engineering phrase goes. Usually the adjustment is made so that as they move to increase the steam supply, they meet a constantly increasing resistance to further motion. This gives them stability of action, but makes the total change of speed between full load and entirely empty, a very considerable amount. The new theory which Mr. Ball developed in the construction of his governor is to bring about changes in the point of cut-off, or in the supply of steam, by the changes of load itself, instead of by changes in the speed of the engine. As the change of load is what causes variation in the speed of the engine, it evidently should determine the amount of steam admitted to the cylinder. This theory is eminently a rational one. The Ball Engine Co. send us the two diagrams, A and C, which we publish herewith, illustrating the action of one of these governors, and the results attained are certainly quite remarkable. Before speaking of them at length, however, the construction of the governors must be mentioned. The cuts show the form of construction used for single-valve automatics, in which the governing is affected by moving the eccentric across the shaft. To understand the application of the theory to a form of governor which at first glance is of quite a common form, a close inspection of the cuts is necessary. The pulley itself is made to form a part of the governor, and is mounted loosely on the hub of an arm which is keyed to the shaft. The fixed arm has a stud at each extremity, on which a pivoted lever is placed, shown in Figs. 1 and 3. The inner ends of these levers are attached to the weights and springs, and the outer ends are connected by links to the arm of the pulley or driving wheel, and are the means by which the wheel itself is driven. Thus it will be seen that the governor is placed between the engine and the work which is being performed, and that it not only transmits all the power, but is also constantly weighing the power transmitted. This weighing of the load is made to act directly on the steam supply through the eccentric. The weight and springs provide the necessary stability, and the resistance of the load is only introduced in sufficient quantity to correct the inherent defects of all governors depending solely on changes of speed for power to act. In external form, as we have said, the governor presents a familiar appearance. Fig. 1 is a view from the outside of the engine; Fig. 2, a view from the inside. Fig. 3 shows the inside with the eccentrics detached, while in Fig. 4 the eccentrics appear in their proper relations with the ball and socket joint. The main eccentric has an oblong shaft opening, and is suspended by a pin on an arm, giving it a pendulum-like motion backward and forth across the shaft. Mounted loosely on the shaft outside of this eccentric is a secondary eccentric, the ring of which engages a stud in the side of the main eccentric, so that as this secondary eccentric oscillates forward and backward on the shaft, the main eccentric is made to swing and thereby vary the steam supply in the usual manner. The secondary eccentric has a sleeve surrounding the shaft, projecting through the oblong hole in the shaft opening. In the end of this is screwed a nut, which covers the oblong shaft opening and keeps both the eccentrics in contact. The two weights are suspended in such a position that their centrifugal force is opposed by the spring, and the resultant of the opposing forces is transmitted through ball and socket joints to the eccentrics.

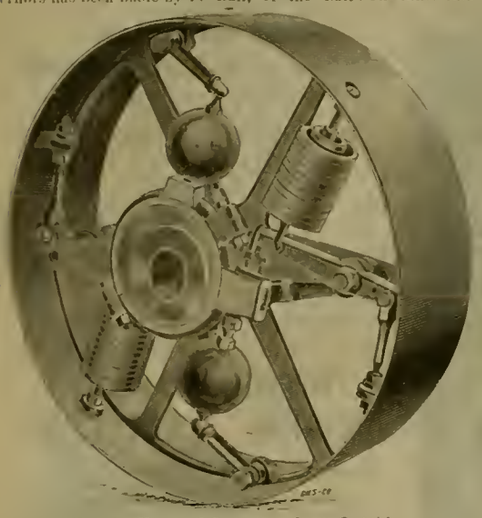


Fig. 1 View of Governor from Outside.

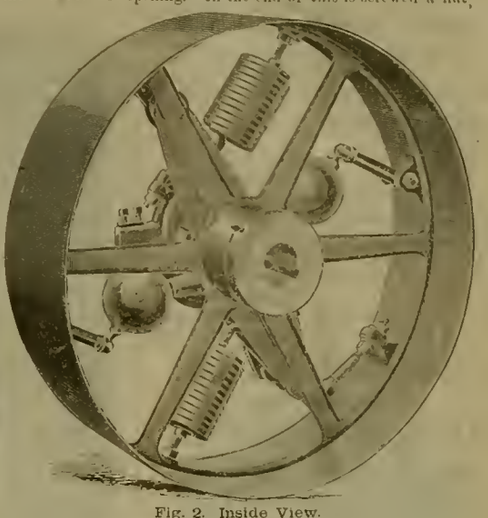
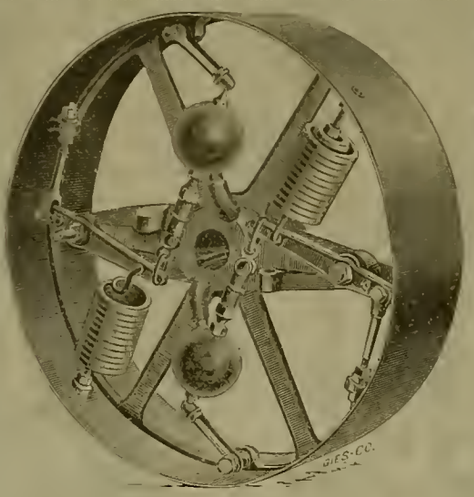


Fig. 2. Inside View.



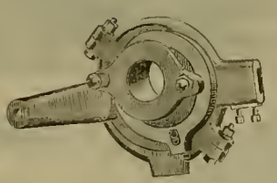


Fig. 3. Governor With Eccentrics.

The speed diagrams A and C, were taken in a rather novel manner. A weight held by a spring in the balance wheel revolved with it, and by centrifugal force, aided by gravity, vibrated in a vertical direction at each revolution. The extent of these vibrations measured the speed of the engine. Of course when the weight was over the shaft, gravity drew it toward the center, and when in the opposite direction gravity drew it from the center. This constant vibration corresponding with the revolutions is what is represented by the nearly vertical lines, the horizontal motion of the paper, which was constant, giving each line a slight inclination. A pencil attached to the weight drew the lines. The diagrams were all taken from the same engine under the same condition of load, which consisted of a wheel submerged in water, so arranged that it could be lifted out or entirely submerged without interfering with the motion of the engine. The engine itself could be controlled either by the new governor or, at pleasure, by one of the common form, which was one of the most popular in the market and highly esteemed for its excellence. Diagram A is a sample of the best work which it could produce under the widest changes of load. In each diagram, near the middle, the load was suddenly thrown on. In A, this point is clearly shown by a marked falling off in the speed.

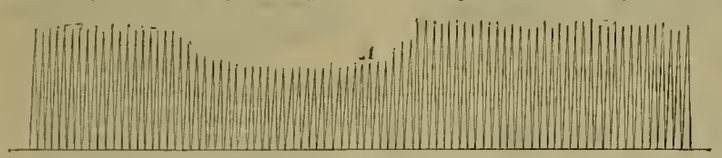


Fig. 4. "A." Speed Diagram from a Common Governor. Load Thrown on and off.

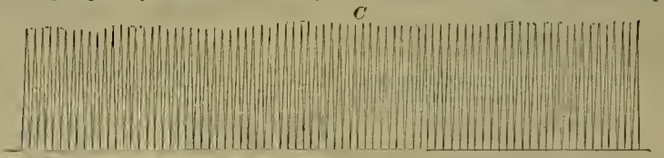
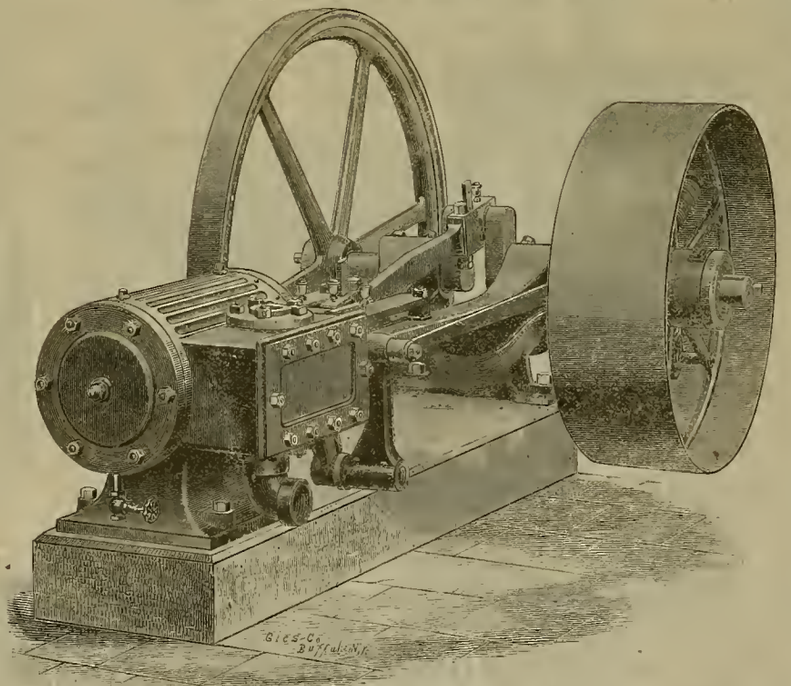


Fig. 5. "C." Speed Diagram from a Ball Governor. Load Thrown on and off.



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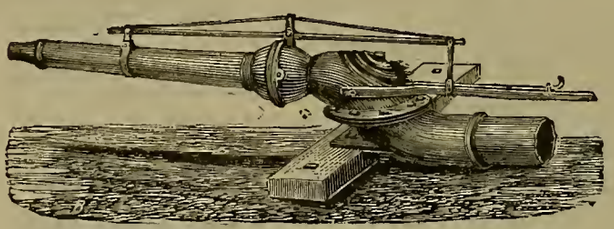
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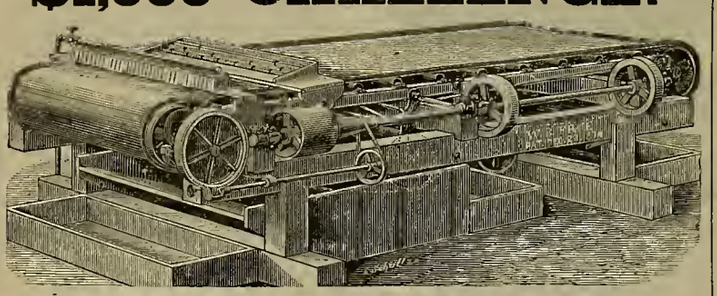
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A machine can be seen in working order, and ready to make tests, at the office of Hinckley, Spiere & Hayes, 220 Fremont Street.

To thoee intending to manufacture or purchaee the eo-called "Triumph" Concentrator, we herewith state:

That legal advice has been given that *all shaking motion* applied to an *endless traveling* belt used for concentration of ores is an infringement on patents held and owned by the Frue Vanning Machine Company.

That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.

That the patent laws make *users* of infringements responsible as well as makers, and the public is therefore warned that there is considerable risk in purchasing any end-shake machine until our various patents have been decided.

That if there are those who for any reason prefer an end-shake machine, we can manufacture and sell to such a machine of that description, as efficient as the Triumph, and at a lower price, and no liability for infringement will then be incurred by the purchaser.

That we shall protect ourselves against any one making, selling or using any machine infringing any of our patents. Patented July 9, 1867; May 4, 1869; Dec. 22, 1874; Sept. 2, 1879; April 27, 1880. Patents applied for.

That we are, and have been, ready at any time, to make a competitive trial against the Triumph, or any other machine, for stakes of $1,000.

ADAMS & CARTER, Agents Frue Vanning Machine Company,

Room 7, 109 California Street, - - - SAN FRANCISCO, CAL

Nov. 6, 1882.

N. W. SPAULDING'S



PATENT DETACHABLE TOOTH SAWS,

Manufactory, 17 & 19 Fremont St., S. F.

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Dealer in Leonard & Ellis Celebrated

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STEAM CYLINDER AND MACHINE OILS,

The Best and Cheapest.

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This is the only Scientifically Constructed Bucket in the market. It is struck out from charcoal stamping iron. No corners to catch. No seams to burst. No interior corners to clog up. It runs with great ease, and half the power of the old style bucket. WILL OUTWEAR HALF A DOZEN OF THEM.

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Room with steam power to let in the Pacific Power Co.'s new brick building, Steveneon street, near Market. Elevator in building. Apply at the Company'e office, 314 California street.

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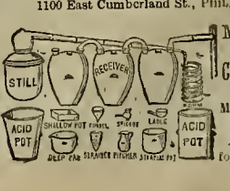
J. CUYAS, Agent,

10 Park Place, - - New York.

RICHARD C. REMMEY, Agent,

Philadelp'hia Chemical Stoneware Manufactory,

1100 East Cumberland St., PHILADELPHIA, PA.



Manufacturer of all kinds of Chemical Stoneware

—FOR—

Manufacturing Chemists.

Also Chemical Bricks for Glover Tower.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F

FOR WEEK ENDING JULY 3, 1883.

280,437.—SEED SOWER ATTACHMENT—Wm. T. Armstrong, Soledad, Cal.

280,561.—SULKY—David Berry, Gualala, Cal.

280,442.—SAFETY CAR TRUCK—Samuel Brown, S. F.

280,443.—BOOT—Thos. H. Buckingham, S. F.

280,370.—DOUGH RAISER—A. P. Gross, S. F.

280,617.—MAKING INSERTIBLE SAW TEETH—Wm. Hawkins, S. F.

280,471.—TURNING WRIST PINS—F. M. Hazleton, Red Bluff, Cal.

280,475.—EXTENSION LADDER AND TRUCK—D. W. Hoover, Gas Point, Cal.

280,484.—GUN SIGHT—J. C. Kelton, S. F.

280,634.—VEHICLE WHEEL—E. Lawson, S. F.

280,384.—RAILWAY OPERATED BY UNDERGROUND ROPES—J. B. Low, S. F.

280,652.—TYPE-HOLDING ATTACHMENT FOR HAND STAMPS—L. H. Moise, S. F.

280,410.—FIRE EXTINGUISHER—A. F. Spawn, Oakland, Cal.

280,532.—FEED CUP—E. J. Thomas, Oakland, Cal.

280,694.—NECKTIE HOLDER—E. B. Warner, S. F.

280,545.—GREASE TRAP—Silas Wilcox, Portland, Oregon.

14,025.—DESIGN (MASONIC JEWEL OR EMBLEM), D. W. Laird, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

ROTARY ENGINE.—Chas. C. Garcelon and Wm. A. Woods, Santa Cruz, Cal. No. 280,027. Dated June 26, 1883. This invention relates to certain improvements in rotary engines, and consists in various details of construction by which steam is admitted through one or two ports, so as to be used expansively, and by means of a hollow piston valve one or both ports may be opened or closed, or the engine may be reversed. In the operation of the engine, the steam is admitted through two ports and pressed upon two of the pistons with which the engine is provided. After thus starting, if the steam is to be used expansively, it is done by closing one of the entrance ports. When this is done, a small portion only of the piston having been projected, the steam follows it as it is gradually forced out, until the next piston reaches the port and intercepts any further supply to the first piston. The remainder of its stroke, to the point where it passes the first exhaust opening, is completed under the pressure of the expanded steam.

FOLDING BOX.—Paride Canessa, San Francisco, Cal. No. 280,013. Dated June 26, 1883. This invention relates to that class of boxes, trunks, valises, etc., which by their construction are adapted to be folded up into a small compass when not in use, thereby facilitating transportation. This box is connected with folding hinged sides, and ends, connected with the sides by peculiar links or hinges, adapting them to fold over the sides when these latter are laid flat. The ends enclose the removable top, and all the parts are secured together by pins. When the box is opened locking devices hold it firm and well capable of carrying its load.

PICTURE BRACKET.—Chas. Megow, San Francisco, Cal. No. 280,057. Dated June 26, 1883. This invention consists in an easily arranged device, to be suspended from the picture molding by other fastenings, and adapted to receive and sustain the picture. This rests on small brackets, and is hooked at its top from behind, by means of which it is supported and its inclination assured. The advantage of this device is in its simplicity, economy and effectiveness. It does away with nails and other means usually employed to suspend and hold a picture at its proper inclination.

Two Salt Lake hoodlums, one a son of Apostle Rich and the other of Probate Judge Smith, shining lights in the Mormon church, entered the Zions' Savings Bank a day or two since, felled the cashier with an iron bar and then made off with all the money they could get.

INDIGESTION, dyspepsia, heart-burn, nausea, etc., cured by using Brown's Iron Bitters.

Attend to This.

Our subscribers will find the date they have paid to printed on the label of their paper. If it is not correct, or if the paper should ever come beyond the time desired, be sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time, we cannot be responsible for the errors or omission of agents.

BOUND VOLUME OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce, and valuable for future reference and library use.

News in Brief.

THE number of deaths in the city of New York vary from 150 to 200 daily.

THE Wisconsin prohibitionists talk of running a candidate for the Presidency.

CHIEF MOSES has completed and signed his agreement to relinquish his reservation in Oregon.

Fires in the Oregon woods have destroyed a great deal of valuable timber, lumber and other property.

IT is understood that President Henry Villard's excursion party to the Pacific coast will number 250 persons.

A WATERFALL 1,500 feet high, is reported to have been discovered at the head of the Cowlitz river, Washington Territory.

FRANK ROGEL, of Oakland, lost four children last week by diphtheria, and his only remaining child lies at the point of death.

DENIS KEARNEY, who lately attended the Anti-Monopoly Convention, was refused admission as a delegate to that body.

THERE were twenty-six cases of sunstroke in New York and six in Philadelphia one day last week. Many of them proved fatal.

PHYSICIANS, it is stated, have discovered over a hundred cases of leprosy among the boys of this city, caused by smoking Chinese made cigarettes.

POSTMASTER General Gresham has affirmed the validity of Key's order, denying the use of the United States mails to the Louisiana Lottery company.

MARCO A. SOTO, President of the Republic of Honduras, is on his way to Washington, with a view of establishing a reciprocity treaty with the United States.

GRIMLEY, the aeronaut who started from Honesdale, Pa., on July 4th, landed on the Catskills, encountered a severe hurricane, and had a terrible time generally.

ABRAHAM GOLDSMITH, a veteran pawnbroker of Chicago, was lately closed out under an execution. It is noted as something unusual in this line of business.

THEODORE THOMAS, who, with his noisy band, collected many ducats from our citizens a few weeks since, speaks now in terms not very complimentary of our people.

ACCORDING to advices from Behera, in Egypt, the cattle plague has ended with the death of all cattle in that district. The cotton worm is now doing great damage there.

ADVICES from Venezuela state that locusts are making havoc in many parts of the country. In one night all the vegetation in the neighborhood of Mooron was destroyed.

IT is reported that a yacht is being prepared and will be held in readiness to take the Khedive to Naples in the event of the spread of cholera making his departure necessary.

St. Mary's Hall, Benicia.

Among our notices of schools on another page will be found the announcement of St. Mary's Hall, Benicia, an institution for the education of young ladies, of which Rev. L. Delos Mansfield is director. Mr. Mansfield is on old and successful teacher, having been engaged in the work in the East long before coming to this coast, and in a school on the Hudson had the honor of educating the children of Wm. Cullen Bryant. His school at Benicia is in a highly prosperous and flourishing condition, enjoys a high reputation, and we doubt not is a most desirable place for the education of young ladies, to which sex its admission is limited. The catalogue contains a list of most desirable references, including some of the most prominent citizens of San Francisco, and gives full information as to the courses of study, terms, etc. Address Rev. L. Delos Mansfield, Benicia, Cal.

THE best cure for diseases of the nerves, brain and muscles, is Brown's Iron Bitters.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

G. W. MCGREW—Santa Clara county.
M. P. OWEN—Santa Cruz county.
J. W. A. WRIGHT—Merced, Tulare and Kern counties.
JARED C. HOAG—California.
B. W. CROWELL—Arizona Territory
M. H. JOSEPH—Eureka, Nev.
I. M. LEIBY—Los Angeles, San Bernardino and San Diego counties.
A. C. KNOX—Oregon and Washington Ter.
J. J. BARTELL—Yolo county.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $4 a year, in advance. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times,) by turning a leaf.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

The Secret

of the universal success of Brown's Iron Bitters is simply this: It is the best Iron preparation ever made; is compounded on thoroughly scientific, chemical and medicinal principles, and does just what is claimed for it—no more and no less.

By thorough and rapid assimilation with the blood, it reaches every part of the system, healing, purifying and strengthening. Commencing at the foundation it builds up and restores lost health—in no other way can lasting benefit be obtained.

75 Dearborn Ave., Chicago, Nov. 7.

I have been a great sufferer from a very weak stomach, heartburn, and dyspepsia in its worst form. Nearly everything I ate gave me distress, and I could eat but little. I have tried everything recommended, have taken the prescriptions of a dozen physicians, but got no relief until I took Brown's Iron Bitters. I feel none of the old troubles, and am a new man. I am getting much stronger, and feel first-rate. I am a railroad engineer, and now make my trips regularly. I can not say too much in praise of your wonderful medicine. D. C. MACK.

BROWN'S IRON BITTERS does not contain whiskey or alcohol, and will not blacken the teeth, or cause headache and constipation. It will cure dyspepsia, indigestion, heartburn, sleeplessness, dizziness, nervous debility, weakness, &c.

Use only Brown's Iron Bitters made by Brown Chemical Co., Baltimore. Crossed red lines and trade-mark on wrapper.

BUY LAND

Where you can get a crop every year; where you will make something every season; where you are sure of having a crop when prices are high; where you have a healthy place to live; where you can raise semi-tropical as well as other fruits; where you can raise a diversity of grain and vegetables, and get a good price for them. Go and see the old Reading Grant (in the upper Sacramento Valley), and you will find such land for sale in subdivisions to suit purchasers, at very low rates and on easy terms. There are 12,000 acres at from $3 to $30 per acre, including pasturage, vine, fruit and grain land. Will sell a large tract at a great bargain. Send stamp for map and circular to EDWARD FRISBIE, proprietor (on the Grant), Anderson, Shasta county, Cal.

DIVIDEND NOTICE.

The German Savings and Loan Society.

For the half year ending June 30, 1883, the Board of Directors of the GERMAN SAVINGS AND LOAN SOCIETY has declared a dividend on Term Deposits at the rate of four and thirty-two one-hundredths (4 32-100) per cent per annum, and on Ordinary Deposits at the rate of three and six-tenths (3 6-10) per cent per annum, free from Federal Taxes, and payable on and after the 2d day of July, 1883. By order,

GEO. LETTE, Secretary.

This paper is printed with Ink Manufactured by Charles Eneu Johnson & Co., 5 and South 10th St., Philadelphia. Branch Offices—47 Rose St., New York, and 40 Le Salle St., Chicago. Agent for the Pacific Coast—Joseph H. Dorety, 529 Commercial St. S. F.

Sewing Machines.

Several first-class styles, good as new, will be sold at a bargain. Call on or address H. F. D., at this office.

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The most delightfully situated colony in Southern California.

Remarkably healthy, being 2,000 feet above the sea level.

Wholly devoted to fruit culture, and especially adapted to oranges and raisins.

Advantages of church, school, store, depot, hotel, stage line, telegraph and telephone.

Illustrated Circulars on Application.

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SAN BERNARDINO, CALIFORNIA.

UNITED STATES

Submarine Monitor

COMPANY,

230 Montgomery Street, Room 20,

SAN FRANCISCO.

WM. H. MILLIKEN, Engineer.

☞ Plans are on exhibition and stock ready for issue. Any information that is desired can be furnished at the office as above.

Spring Valley Water Works.

OFFICE, 516 California St., San Francisco, July 6, 1883.

The Annual Meeting of the stockholders of this Company for the election of Trustees for the ensuing year, and for the transaction of such other business as may be brought before the meeting, will be held at the office of the Company, on the EIGHTEENTH OF JULY, 1883, at 12 o'clock M. By order of the Board of Trustees.

WM. NORRIS, Secretary.

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Extra Quality Endless Belts, Steam and Suction Hose, Air, Oil and Brewers' Hose, Car Springs, Valves, Gaskets, Etc., Etc.

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LAND Good farm land that will raise a crop every year. Over 12,000 acres for sale in lots to suit. Very desirable Fruit, Vine, Grain, Vegetable, Hay, and Pasture Land. Near Railroad and Sacramento river; $3 to $30 per acre. Wood and water convenient. U. S. Title perfect. Send stamp for illustrated circular, to EDWARD FRISBIE, Proprietor of Reading Ranch, Anderson, Shasta Co., Cal.

Inventors L. PETERSON MODEL MAKER.
258 Market St., N. E. cor. Front, up-stairs, San Francisco
Experimental machinery and all kinds of models, tin, copper and brass work

Mining Companies.

Persons interested in Incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

Seaton Gold Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Drytown, Amador county, California.

NOTICE.—There are delinquent upon the following described stock, on account of Assessment No. 2, levied April 10, 1883, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Scott, E A	4	10	$ 75
Warner, Alex	5	10	75
Martin, A, Trustee	6	5,000	375 00
Martin, A, Trustee	7	5,000	375 00
Martin, A, Trustee	8	5,000	375 00
Martin, A, Trustee	9	5,000	375 00
Martin, A, Trustee	10	1,000	75 00
Martin, A, Trustee	11	1,000	75 00
Martin, A, Trustee	12	1,000	75 00
Martin, A, Trustee	13	1,000	75 00
Martin, A, Trustee	14	1,000	75 00
Martin, A, Trustee	15	1,000	75 00
Martin, A, Trustee	16	1,000	75 00
Martin, A, Trustee	17	1,000	75 00
Martin, A, Trustee	18	1,000	75 00
Martin, A, Trustee	19	1,000	75 00
Martin, A, Trustee	20	500	37 50
Martin, A, Trustee	21	500	37 50
Martin, A, Trustee	22	500	37 50
Martin, A, Trustee	23	500	37 50
Martin, A, Trustee	24	500	37 50
Martin, A, Trustee	25	500	37 50
Martin, A, Trustee	26	500	37 50
Martin, A, Trustee	27	500	37 50
Martin, A, Trustee	28	500	37 50
Martin, A, Trustee	29	500	37 50
Martin, A, Trustee	30	1,000	300 00
Martin, A, Trustee	31	900	67 50
Davis, John A	32	90	6 75
Martin, A, Trustee	33	5,000	375 00
Martin, A, Trustee	34	5,000	375 00
Martin, A, Trustee	35	5,000	375 00
Martin, A, Trustee	36	4,900	367 50
Kellogg, C W	37	100	7 50
Martin, A, Trustee	38	5,000	375 00
Martin, A, Trustee	39	5,000	375 00
Martin, A, Trustee	40	5,000	375 00
Martin, A, Trustee	41	5,000	375 00
Martin, A, Trustee	42	5,000	375 00
Martin, A, Trustee	43	10,000	750 00
Fischer, Bertha C	45	100	7 50
Cornwall, P B	46	4,800	366 75

And in accordance with law and an order of the Board of Directors, made on the 10th day of April, 1883, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at 528 California St., Room 6, San Francisco, Cal., on TUESDAY, the 5th day of June, 1883, at the hour of 1 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

A. MARTIN, Secretary.

OFFICE—Room 6, 528 California St., San Francisco, California.

POSTPONEMENT.

The above sale of delinquent stock is hereby postponed to THURSDAY, the 28th day of June, 1883, at 1 o'clock P. M., at the same place. By order of the Board of Directors. A. MARTIN, Secretary.

San Francisco, June 6, 1883.

The above sale of delinquent stock is hereby postponed to THURSDAY, July 26, 1883, at 1 o'clock P. M., at the same place. By order of the Board of Directors.

A. MARTIN, Secretary.

San Francisco, June 28, 1883.

DIVIDEND NOTICE.

OFFICE OF THE
Standard Consolidated Mining Company.

San Francisco, July 2, 1883.

At a meeting of the Board of Directors of the above named company held this day, Dividend No. 56, of twenty-five cents (25c.) per share, was declared, payable THURSDAY, July 12, 1883, at the Farmers' Loan and Trust Company, in New York, or at the office in this city.

WILLIAM WILLIS, Secretary.

OFFICE Room No. 20, Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE
Bulwer Consolidated Mining Company.

San Francisco, June 21, 1883.

At a meeting of the Board of Directors of the above named company, held this day, Dividend No. 18, of fifteen cents (15c.) per share, was declared, payable on Monday, July 2, 1883. Transfer books closed on Saturday, June 23, 1883, at 12 o'clock M. This dividend is payable at the Farmers' Loan and Trust Company in New York, on all stock issued there, and at the office in this city on all stock issued here. WM. WILLIS, Secretary.

OFFICE—Room 20, Nevada Block, No. 309 Montgomery Street, San Francisco, Cal.

ASSESSMENT NOTICE.

Gould and Curry Silver Mining Company.
ASSESSMENT No. 45.

Levied.....June 15, 1883
Delinquent.....July 20, 1883
Day of Sale.....August 13, 1883
Amount.....Fifty cents per share.

ALFRED K. DURBROW, Secretary.

OFFICE—Room No. 69, Nevada Block, No. 309 Montgomery Street, San Francisco, Cal.

Mining Books.

Orders for Mining and Scientific Books in general will be supplied through this office at published rates.

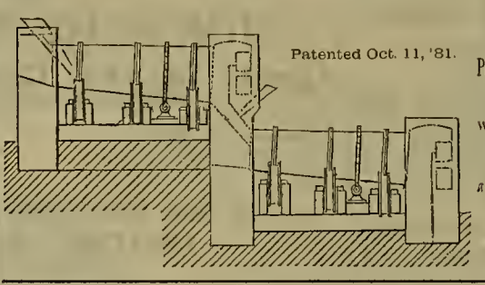
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HERCULES POWDER

HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in use, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fumes, notwithstanding bombastic and pretentious claims by others.

It derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.

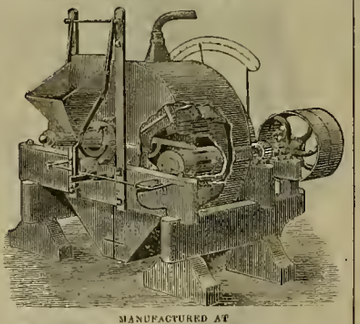
No. 1 (XX) is the Strongest Explosive Known.
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PATENTED IN THE UNITED STATES PATENT OFFICE.
ORDERS RECEIVED FOR HERCULES CAPS AND FUSE.
JOHN F. LOHSE, SEC'Y.
Office, No. 230 California Street - - San Francisco, Cal.

William Hawkins.
(SUCCESSOR TO HAWKINS & CANTRELL).
MACHINE WORKS
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Manufacturer of
IMPROVED PORTABLE HOISTING ENGINES,
FOR MINING AND OTHER PURPOSES.
Also of the HAWKINS' PATENT ELEVATOR HOIST, for Hotels, Warehouses and Public Buildings.
Steam Engines and all Kinds of Mill and Mining Machinery.


Patented Oct. 11, '81.

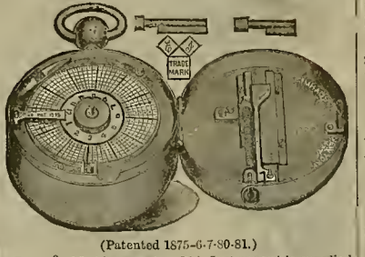
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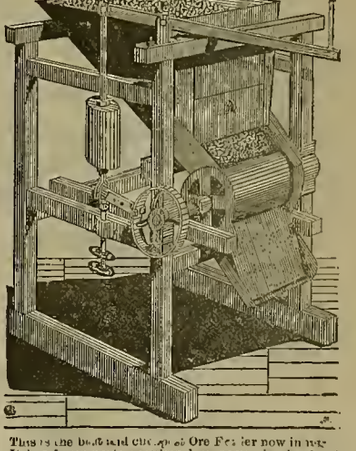
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By W. I. TUSTIN, Inventor and Patentee.

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WITH SAFETY LOCK ATTACHMENT.



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In the Bunker Hill Mill it has run continuously for two years, never having been out of order or cost over a dollar for repairs.
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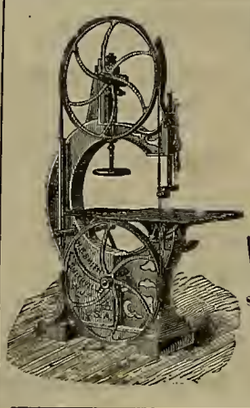
There is for sale in this city, by I. A. Heald, American Machine and Model Works, 111 and 113 First St., a Rutherford Pulverizer, an improved revolving barrel crusher, which was only used a few times and is as good as new. It will be sold very much below cost, and miners who are in need of such an appliance for a small mine will do well to make inquiries concerning it. It is suitable for a pulverizing mill for powder or other substances. References as to above can be had upon applying to this office.

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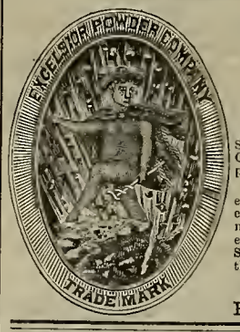
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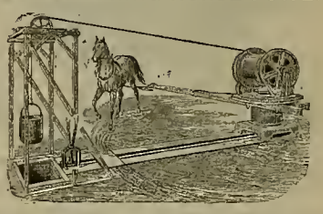
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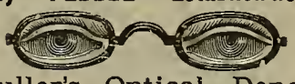
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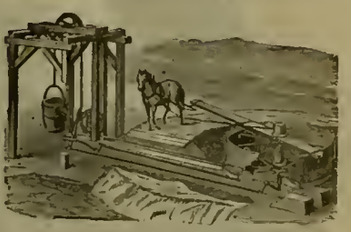
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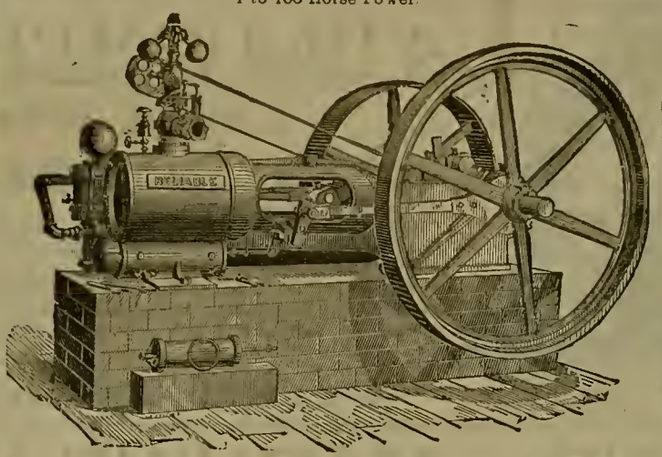
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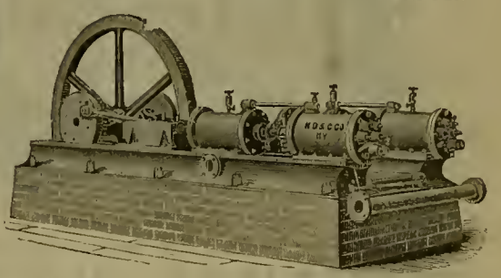
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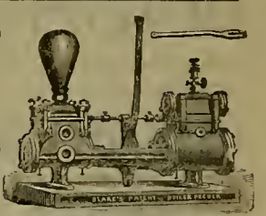


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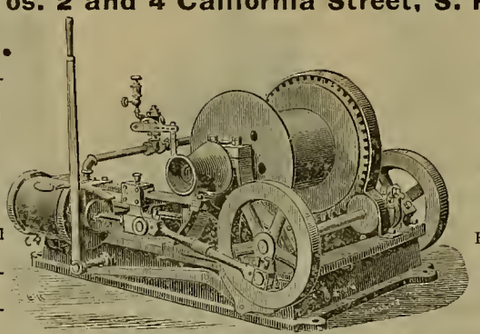


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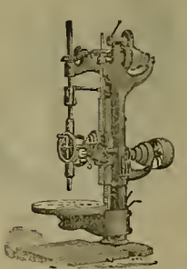




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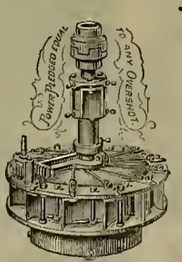
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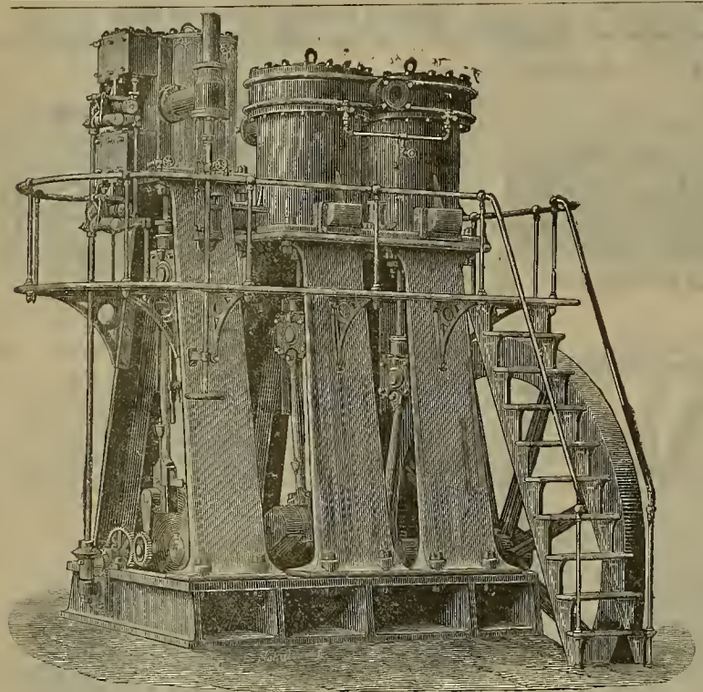
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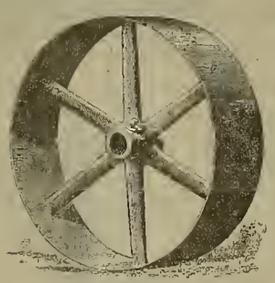
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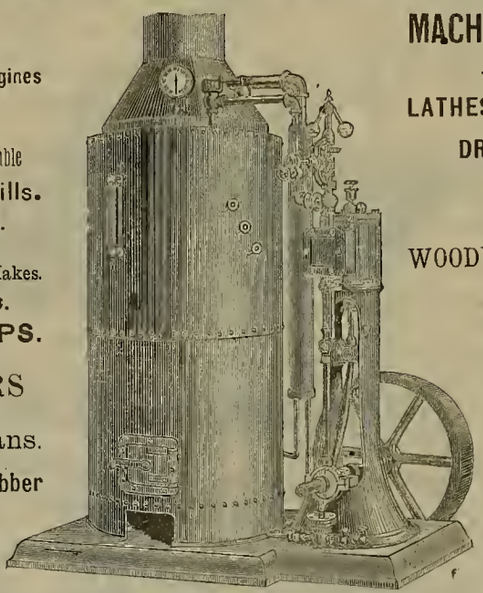
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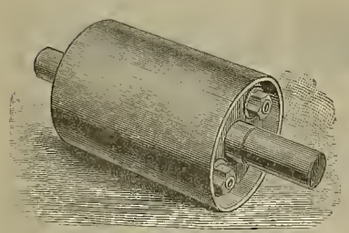
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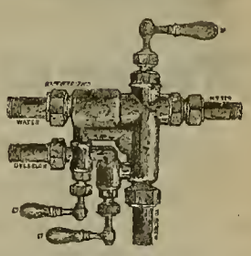
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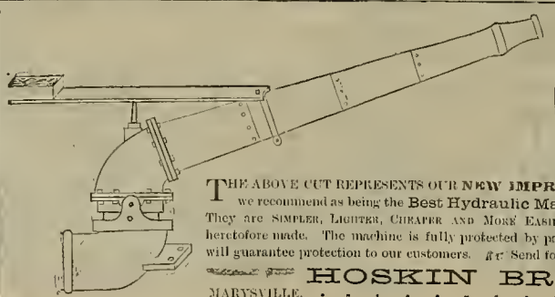
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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, JULY 21, 1883.

VOLUME XLVII Number 3.

The Dyer Cannon Ball Quartz Mill.

We present on this page cut illustrating a new style of quartz crusher, called the Dyer Cannon Ball mill.

Referring to the cut, A is a hopper through which the quartz enters the cylinder or rock-breaker. B B, the top section and upper shaft of cylinder, is in one casting, and has no connection with the cone or machinery working the mill.

C 1, C 2, C 3 and C 4 are the sections of hard iron bolted together, as shown, which comprise the cylinder. The lower section, C 4, is curved inside, to correspond according to a certain rule with the cone, and constitutes the principal wearing part of the cylinder, and as it does so, the section above it takes its place, and so on continuously. D, escape of crushed quartz from the rock-breaker. E, where it descends to the balls, beneath which, when further pulverized, it passes through the screen, C.

What is termed the cone, not shown in the cut, is provided with a "shoe" to renew the wearing parts, and is the only section directly acted on by the power driving the mill.

The cylinder and cone, which together constitute the rock breaker, rests upon a series of hard iron balls in circular grooved tracks above and below, moving or rotating freely upon them, and turning together in the same direction. Upon the introduction of the quartz, the cylinder and cone close continuously upon it, exert a terrible force, and the rock breaks up from point to point until it finally falls out through the discharge space of such degree of fineness as desired. From this point the crushed quartz passes beneath the balls, and is further crushed by the weight of nearly the whole mill upon them, and the crushing force of the rock breaker combined; the pulverizing is there finished and passes through the screen.

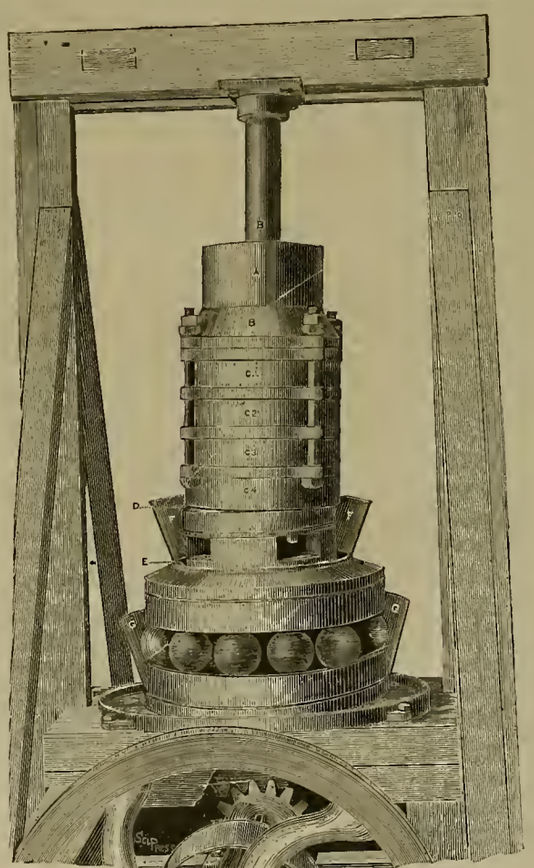
It will be seen that every part of this machine does some work; there are no idle pieces, even the weight as a whole contributing largely to the operation.

For this quartz crusher the inventor claims the following advantages as compared with stamps:

Less cost, wear and weight, and less power to run it, the reduction being from forty to eighty per cent. Being light and made in sections this machinery can be packed into localities where ordinary quartz mills could not be taken. The cannon ball crusher is simple, compact and strong, not liable to get out of order, and almost any one being able to run it. Parts that wear out most readily are easily replaced.

The movement is rotary, crushing (not grinding) either wet or dry equally well, and running in either direction the same. Runs light, makes but little noise, and does not injure by running empty. Will crush according to power used, readily geared for steam, water or horse power, and can be run by hurdy gurdy wheel on pinion shaft. Occupies but little space. Is quickly set up and removed. Will take in good size quartz, dispensing with rock breaker where this is an object or necessary; leaves the gold bright and easy to amalgamate, and can be cleaned up in a few minutes; the discharge ample, and but little wear on the screen, no coarse quartz coming in contact with it. The frame can be constructed where used, thereby saving freight.

Several of these mills have been put up and are now running at different points in the mines, and are said to give entire satisfaction. A number more are now being built at the Globe foundry in this city, to fill orders from the interior. The prices of these mills vary with size. No. 1, capacity 6 tons, weight 2,500 pounds, costs $350; No. 2, capacity 12 tons, weight 4,500 pounds, $600. Larger mills in proportion. Two smaller sizes than No. 1 are made, and of about 500 and 800 pounds weight, and of about 1½ to 3 tons capacity respectively. These are convenient for prospecting, etc. Parties interested in ore crushing can see these mills in operation at No. 520 Fifth street, where they are invited to call and witness the same. One of them has been running for several months near Iowa Hill, Placer county; also one at Grizzly Flat, El Dorado county; whence come favorable accounts of the work done by them. A number of the machines have been



DYER CANNON BALL QUARTZ MILL.

ordered by mine owners about Grass Valley, and elsewhere in Nevada and adjacent counties. As this mill seems to meet a long standing want of our quartz miners—something cheap, durable and portable—we should be glad to be kept fully advised as to results of further trials of its merits.

Bessemer Cast Steel.—It is said that the first cast of Bessemer steel in America, was made on the 7th of May, last, at the Pennsylvania Steel works, Harrisburg, Pa. The pig iron contained two and a half per cent of phosphorus, and was made from a mixture of South mountain ore and mill cinder. The resulting steel contained only 0.04 phosphorus and 0.12 carbon. The steel was made in the old plant of the works named, which has two seven-ton converters, the pig being re-melted in a cupola. Several heats were made last week with complete success.

Working Miners and Bullion Production.

According to the last report of the Director of the Mint, the number of men at work in the mines of California in 1882 amounted to 37,147, being much the largest number so employed in any of the States or Territories of the Union, Colorado, with 28,970, ranking next in this respect. While the bullion product of Colorado for that year reached $19,860,000, that of California amounted to only $17,645,000; the smaller number of men employed producing in this instance the larger amount of bullion. Generally, this would be construed to the prejudice of California; so, however, we do not view it. We have not in this State, as they have in Colorado, Nevada, Utah and Arizona, any mining companies making an inordinately large and profitable production of bullion. There is not in the State a single company whose gross annual product reaches half a million dollars. But we have a good many companies who are making very fair, and in some cases large net earnings on the amount of capital invested.

With us the profits of mining are widely distributed. A high percentage of those here engaged in the business are self-employers. They own the claims they work, and any resultant profit inures to themselves. This class of miners is probably twice as numerous here as in Colorado. This is due to the habits of our people, coupled with the diversified character of our auriferous deposits and the various methods of working them. The old Californian dislikes to work for wages. He would rather be his own boss though he earn not over a dollar per day, than to receive two on hire. Then, our gold mines are so extensive and varied in form that they give room for a large working population. In each department of the business we have many different kinds of deposits. In quartz mining we have regular veins, seams and bunch deposits. In placer mining we have hydraulic, drift, river-bed, gulch, beach and divers other forms of operating. In the prosecution of some of these branches but little outlay for plant or apparatus is required, so that the man of small means, if so inclined, can very often engage in them to advantage.

As a consequence of these conditions the California miner is apt to be the possessor of a home, generally comfortable and sometimes almost luxurious. He has usually a well-built house with a garden and fruit trees about his dwelling. Very often these men own and cultivate a considerable tract of land. Fruit, grain and cattle growing is made a part of their business, being looked after at such times as mining does not require their attention. Along the entire main gold belt of California, fruits of most kinds and of fine quality can be grown with the greatest facility. Fair crops of hay and grain can also be raised here without much trouble. Water is good, fuel and lumber cheap, and the climate unequaled for salubrity. Through the construction of railways and good wagon roads, nearly all the mining districts of this State are now easily accessible. Enjoying so much that is essential to their comfort and happiness, the California miner is incomparably better off than the fraternity elsewhere, even though his average earnings be not quite so great. So, too, the bullion product of our State, though it suffer by comparison with some of our neighbors, serves no doubt a more beneficent purpose than the much larger amounts taken out by them.

Product of Quicksilver During the Past Year.

We are indebted to Mr. J. B. Randol, agent of the New Almaden mine, for the following table, showing the output of quicksilver by the several mines worked in this state during the year ending June 30, 1883, and the total production made. Besides the properties named in this list, a few mines were worked in a small way, their entire yield being estimated by Mr. Randol at only 671 flasks. As this gentleman possesses superior facilities for obtaining correct data on the subject of quicksilver production in this State, and is careful in collecting the same, his figures and statements may be accepted as authoritative:

Mines.	No. Flasks.
Napa Con.	6,351
Great Western	3,514
Sulphur Bank	3,053
Reddington	2,655
Great Eastern	2,673
New Idria	1,720
New Almaden	28,753
Various	671
Total	51,290

An Old Electric Light Patent.—The first attempt to manufacture electric incandescent lamps, has been ascribed to M. de Chagny, whose operations were said to have been conducted some twenty years ago. The credit of the invention and its practical application, however, are now claimed for a young American, Mr. Starr, whose patent was taken out in 1845.

CORRESPONDENCE.

Ross Camp.

Hassayampa District, A. T.

[From our Arizona Correspondent.]

Ross Camp, a part of the Hassayampa mining district, lies about twelve miles south of Prescott. It is very elevated, being situated at the head of the Hassayampa creek, and nearly as high as the Flint mines on the Union peak ridge, at the head of Jersey gulch. The country about the camp being a little lower, shows less gold and more silver, lead and copper, especially as the veins get below water level.

In company with Col. Biglow, I first visited a singular kind of ore lying apart from the principal mines. The vein is very wide, thirty feet or more across, and some portions giving high assays of silver.

This location, called the Sumner, has been developed by an open cut, run forty feet through hard slate. It shows a very strong lead of silver bearing ore, in conjunction with slices or kidneys of mineral resembling iron carburet, being in fact a micaceous iron. It is free from grit, very bright, and so soft as to rub fine between the thumb and finger.

The prospects here were so good that the owners were encouraged to go below and tunnel in to strike the vein. They encountered hard slate country rock, showing glittering iron sulphurets, the cost of tunneling amounting to about $12 per foot. They found similar indications below as above. The whole is yet a mystery and a new experience, awaiting counsel and cash for further prosecution, if the owners so advise. (This property is now bonded in the East.) Two miles north of this locality, over the ridge, is

"The City of Mines,"

And I hereby copyright this name for this numerous family of separate leads, because if they were mapped off they would look like the streets of a town, with a main artery and many throughares.

The Davis, a silver-bearing lode, and the largest of the group, is traceable for miles. The mines on either side of this lode keep mostly parallel to each other, and come to join the Davis at an acute angle. A visit of a few minutes, passing hastily from one claim to another at different hights on the mountain, makes it risky to attempt any minute description of this city of mines, all existing in a genuine practical and visible sense. They belong largely to the burro whacking prospectors. The southerly and lower end of the Davis or Broadway is owned by Col. C. C. Bean and is well prospected by a tunnel 200 feet long. The supposed average assay value of the Davis ledge is given at $150; ledge five feet thick.

Other Lodes and Average Assays.

The Pearl, North Davis and Dunkirk, all strong well-defined veins, are opening up with good ore. They are owned by Dr. Smith and Col. Biglow, who are now piling up ore on the Dunkirk dump for shipment. Assays from the dark blue streak of the vein gave over $800 per ton; $477 gold, balance silver. This streak is four to six inches thick. A vein adjoining assays $282, $162 being gold, balance silver. The stratum here is about twelve inches thick. The iron streak on the west hanging wall, four to six inches, gave $35 gold, and some little silver.

Near the above lodes lies the Esmeralda, with piles of ore all bright, clean and free from cab-rock. This lode belongs to Dan Hatz and Don Nejia, who manage the work, and can tell to a cent the assay value of the different classes of ore on the dump. Many of these consist of azurites with chlorides, some of which have assayed over $1,000 per ton.

The Dosoris (wife's dower) is another, and favorite lode, carrying many kinds of rich ore, some nearly native silver itself. It is prophesied here that this mine will yet make some man rich.

Howell's Blue Dick forms one of the alley streets in this city of mines. It is idle, but filthy in lucre. It would be tedious to mention even a tenth of these well-named streets that promise in the early future to do each a wholesale business, on square coin basis. Among the names of mines here are those of nearly all the presidents, the birds of the air, and the States of the Union.

The old Senator mine, on the east side of the mountain, is also entitled to notice, seeing it has on many accounts besides its age, claims to honorable mention. Its ample development of 200 feet deep shows hidden treasures of gold to the amount of $160,000. The Senator, when on duty, speaks through the rappings of a ten-stamp mill.

Robert M. Hansen, a lad fourteen years old, has just discovered a fine galena silver vein, and bridged the faulty law by locating it in the name of his mother. The claim is traceable 700 feet in outcrops, and is found in excellent company. This clever lad was the first child born of a white mother in White Pine, Nevada, and must be a natural miner.

From the divide above these claims, Dr. Smith proposed "to play satan on me" by pointing out the vast wealth of the surrounding country and attempting to awaken in me, a foolish desire to possess myself of the same.

Below us was Slate creek, a branch of the Hassayampa, noted for the fact that this city of mines is located at its head branches. Beyond is the deep gorge of the big Hassayampa and off towards the south Walnut grove, one of the prettiest ranches in the Territory, owned by A. Wade, in the early sixties a successful quartz-mill man at Dayton, Nev. A little to the westward lies Antelope Mt., site of one of the early gold excitements, and in which thousands of dollars were taken out in a single day, and this without water for washing. It is now proposed to buy this Walnut grove ranch for a great reservoir site, and work the grounds below, which are very rich, by the hydraulic method.

Above and to right of Walnut is Peoples valley, named after one of the earliest settlers, still living there. Kirkland and Skull valleys follow. Just this side of Skull valley is Copper Basin, with Bradshaw peak named after Isaac Bradshaw, yet living and active, though carrying three-score years. He is widely known as "Uncle Ike," a title of respect. Bradshaw has taken a great interest in locating and developing the group of Copper Basin mines. Though strongly wedded to camp life, he retains his social and urbane manners, making him many warm friends. His brother, a noted pioneer and prospector, for whom the Bradshaw range of mountains was named, has been dead for many years.

The lofty knob behind and towering over us is Bean's Peak, so-called in honor of Col. Bean, who did good service in the late war for the preservation of the Union, and is now a resident and large mine owner in this district.

Things of the Past.

In my recent visit to the Hassayampa district, I crossed the bed of a deep rocky creek, the well-worn rocks of which showed that it carried sometimes a great volume of water, though so little is running there now that a man can step across it. On the bank of this creek I noticed an old house, the remnants of a water-wheel, and an old arastra, the place being now deserted. But these remains denoted that here had been made an effort some time ago to work the quartz, of which there is plenty and good looking in the neighborhood. This work was done before the present well-graded wagon-road, leading into the district, was built, and at a time when everything had to be packed in on animals. That the enterprise was abandoned does not prove the ores to have been lacking, or of poor quality, but only that there were too many obstacles to be contended with at that day to warrant the miner continuing his efforts. I know not the history of this plant, but just such small beginnings that often seem failures, and do bankrupt first parties, are the startings that in these frontier countries finally result in wagon-roads, quartz mills, saw-mills and towns. Then follow the continental railroads and their various branches, and the mountains and valleys are made to yield up their wealth and help to furnish the means for luxury and refinement, here and elsewhere. The prospector shows the place for profitable investments, though too often he reaps little of the benefits of the great treasures he discovers. The rich and poor can and should mutually benefit each other.

Passing onward and upward two miles the wagon road mentioned leads to the mining claims of Wm. C. Flint, formerly of San Francisco, now pleasantly located in this section over 7,000 feet above sea level in the midst of heavy pine forests, cool waters, and grand distant views. While in the Hassayampa country, I visited

The Delaware Mine.

Located on the top of a high ridge, and lying northeast and southwest. It is a large, well-defined ledge six feet wide, with ore vein of about two feet; rock, rusty decomposed quartz, carrying gold, silver, lead and copper, and will work $25 to $30 per ton. The vein has a regular course, and dips about 80 degrees, being nearly perpendicular. On this vein cuts and shafts have been made at various points to prove the continuity of the ore; one shaft is fifty feet deep. From this point to the southeast, across a ravine, in plain view, are

The Crook and Providentia Mines.

Supposed to run into this point. The Crook mine, which has produced considerable bullion, has a small prospect mill a few miles distant on the east branch of the Hassayampa now idle. The property belongs to Mr. Buffum, merchant in Prescott, and is reputed to be valuable. It is not free milling ore. The Delaware, at the extreme southwest end of location, has an open cut showing estimated $50 ore; 100 feet from this cut is a fifteen-foot shaft, the ledge growing to the thickness of five and a half feet at bottom of shaft. Mr. Flint has spent his labor on various points, and enough of it to show good looking mineral extending all through this 1,500 foot location.

The locality is easily accessible from the main road by a good wagon road leading one-half a mile through a beautiful pine forest, in which is excellent pasture and good water. But my pilot moves on to show me his other mine,

The Grosvenor.

Gold and silver, located near by, and also well shaded with cooling pines. "This is my south monument; here you see the course of the vein," etc., as an enthusiastic miner will talk when he thinks his text is solid. "This shaft is 500 feet from that south monument, is thirty feet deep all in ledge matter; from the croppings not less than twelve feet thick from wall to wall." This rock, a rusty, porous quartz, prospects well by the pan, but none of it has been milled.

Passing north by some small shafts and cuts, we arrive at the main shaft of the Grosvenor, 50 feet deep with a 50-foot level run south from the bottom. Descending this shaft, the vein is found to be about three feet thick, giving evidence of a good mine. The site of this lode being 7,666 feet above sea level we get here a fine view of the country for a great distance around. These are supposed to be the highest mines worked in the Territory. Looking off we see to the west of Prescott the Senator gold mine, owned by C. P. Head and Hugo Richards, and in nearly the same direction is the Dosoris silver mine, owned by a New York company; also the Blue Dick silver mine, owned by the Howell Smelting and Milling Company, at Lynx creek. A little further south is the Davis silver and gold mine of C. C. Bean, and Dan Hatz mine, with many more well developed claims at the head of Slate creek, a branch of the main Hassayampa. The Davis and Hatz ores of high grade have been reduced at Howell's works. Looking north is the head of Lynx creek—a heavy range of smooth mountain, covered with pine fit for lumber, mining timbers, fuel, etc. There are in that direction several good mines.

On the north slope of this range is located a mine and mill, owned by a Chicago company, who paid $110,000 for the mine, on which they have put up a Huntington oscillating crusher mill; also Wadleigh & Co.'s mine and mill of five stamps, and on the same lead as the Grosvenor, and only two miles distant. A little to the eastward of north is the Maj. Dakes group of mines, and a little below, his smelting works and saw-mill. Close to him is the Belle mine and Howell's reduction works, and the new town Howell.

Those valleys seen off through the low divide are good stock and farming valleys, and away beyond—seventy-five miles—are the San Francisco mountains. To the southeast is Turkey creek. Now who would not like to do up Arizona from one of these lofty shaded mounts? I do not blame our zealous California botanizers—J. G. Lemmon and wife—for making Arizona mountains a part of their home-station each year. I found in a garden at Copper mountain the wild potato discovered by him, now under cultivation by Mr. G. W. Hill, who hopes to develop it to useful size. Mr. H. remarked, as he showed it to me: "It's the prettiest thing you ever saw, as smooth as an egg; can't see any eyes till they sprout out."

Looking east, Mr. Flint, my guide, pointed out a high summit called Mt. Union. Elevation, 9,000 feet; the highest point in this region. The tourist can gain a grand panoramic view from this summit, and have no rocks to climb and no underbrush to ruffle his temper; shady, and perfectly luxurious for open air sleeping.

Descending the mountain about 200 feet we arrive at

The Fremont Mine,

With three shafts, twenty feet, twenty-five feet and forty feet deep, and three tunnels, twelve, twenty-five and thirty-five feet in length, all in vein matter and ore plainly traceable for 1,500 feet. Below the Grosvenor and Fremont joint tunnel is a good site for reduction works, with wood for years.

On the Grosvenor lode two tunnels have been run, one forty and the other 200 feet long, all in ore and vein matter.

Average samples of ore from these mines assay $40 per ton. Fifty tons worked gave good results. It is gold bearing, free, and presents a good appearance to the eye.

What Pluck will Do.

Mr. Flint met with reverses a few years since in San Francisco, and gave up everything, and landed in Prescott with less than one dollar cash capital. He proceeded at once to the mines, where he now has control of the property I have described. He has done the most if not all of this work, and it is well done too. He has now, after all these years of toil, a valuable compact mining estate, thoroughly prospected and ready for a company with means to employ skilled operatives and put up proper reduction works. With these conditions fulfilled, success is certain. This is one of many claims of varied character scattered through this belt now easily reached, the Arizona & Pacific railroad running sixty miles north and the Southern Pacific 145 miles to the south. The reason these mines have not sooner been developed is that the cost of doing so prior to the advent of the railroads has been too great, there being long stretches of sandy deserts to cross, and the Indians in former days giving much trouble.

Then the question is simply as to the value of ore thus exposed. A party desiring such information sent Mr. Riggs as expert to sample for average as well as he could; so he picked from different points clear across the ore stratum from wall to wall, which was assayed by Mr. Blake, of Prescott, and acknowledged to go $24, with a slight suspicion that all doubts were construed against the ore. Some fifty tons were worked.

B. W. CROWELL.

Prescott, Arizona.

More about Nickel.

EDITORS PRESS:—In your issue of July 7th, I noticed an article on the metallurgy of nickel, by Mr. Geo. J. Rockwell, of Sacramento, who claims to be the first on the coast to produce a bar of nickel bullion by simply smelting it from the ore. As this character of mineral has but lately come into prominence, but little thought or experimenting upon the method of working has been done, consequently, metallurgists have given the subject but little study; however, I desire to correct the above by a few facts which came under my observation.

In the fall of 1881 I sent to Mr. Charles Bell, of Sacramento city, ten samples of copper carbonate, for assay. Among them were two samples, one of deep apple green, the other a dark gray, intermixed with manganese. These samples proved upon analysis to be a fine grade of nickel. Upon this showing, Wm. S. Bell, of Oakland, an experienced miner, came to my place, and we examined the country for miles, being rewarded by the discovery of the Table mountain and Cottonwood canyon mines, samples of which were forwarded to Charles Bell, of Sacramento, who thoroughly analyzed them; also Edwin Booth, of San Francisco. Since that time Mr. Bell has been experimenting upon the feasibility of extracting the metal upon the ground; this he has accomplished, by smelting several bars of nickel from the ore as taken from the ledge, and a furnace of peculiar design is now being erected by Smith & Bell, in Sacramento city, in order to thoroughly demonstrate the practicability of erecting a smelter upon the mines, when we hope to again bring the State of Nevada into notice and renew the flush times of the Comstock, as their is no doubt but these nickel mines will open out far beyond all expectations, as large bodies have been exposed which grade from seven to thirty per cent. Work is being pushed forward as fast as possible, and the company are determined to leave nothing undone to thoroughly develop their property.

Lovelocks, Nev., July 11, 1883. L.

Assay Ton System of Weights.

Walter Lee Brown, author of Brown's Manual of Assaying, writes on the above subject to the Chicago *Mining Journal* as follows:

The so-called assay ton system of weights seems to be one of the bug-bears surrounding the art of assaying to many beginners, especially those advanced in years and opposed to progress, and whose knowledge of weights is based entirely upon the arbitrary systems known as the Troy, Apothecaries' and Avoirdupois. There is no difficulty in understanding it, and I think my explanations will make the matter clear to all.

The assay ton system is not restricted to any one system of weights—it can be applied to all, be they in use in whatever country they may.

First, then, to illustrate its use: An assayer weighs, of an ore to be tested, we will say 1-5 A. T. (assay ton.) Very well, as a result he obtains a bead of silver weighing 10 milligrammes. If 1-5 A. T. produces 10 mgrs., (milligrammes), 1 A. T. of the ore will produce $10 \times 5 = 50$ mgrs. of silver, and the assayer reports the ore as carrying 50 ounces of silver to every ton. The simplicity of the arithmetic, rapidity of calculation, and difficulty of making mistakes are all apparent here; but let us see where he obtained his starting weight of 1-5 A. T., and what relation it bears to the well-known ton.

In this particular case the French or metric system of weights is the one employed as a basis; but that is immaterial, as will be shown further along. To proceed: 1 ton Avoirdupois = 2,000 pounds Avoirdupois; 1 pound Avoirdupois = 7,000 grains Troy; therefore, 1 ton Avoirdupois = $7,000 \times 2,000 = 14,000,000$ grains Troy; 1 ounce Troy = 480 grains Troy; hence, $14,000,000 \div 480 = 29,166$ ounces Troy in 1 ton Avoirdupois.

Now, the assay unit, called the assay ton, is (in this case) a weight of 29,166 grammes (a gramme being equal to 15.4 grains Troy), or, (1 gramme being equivalent to 1,000 milligrammes) 29,166 milligrammes. Hence the relation of milligrammes to ounces is as 1 to 1—in other words, a milligramme corresponds to an ounce; so that if by assay of 1 A. T. of the ore we obtain gold or silver to the amount of 4 milligrammes, then, without any calculation, we know the ore will run 4 ounces to the ton.

The above calculation starts out with the short or American ton of 2,000 pounds. The long or British ton weighs 2,240 pounds, but we can use it in like manner as a factor, thus: $7,000 \times 2,240 = 15,680,000$; $15,680,000 \div 480 = 32,666$.

Hence the unit of an assay ton system for Great Britain or Canada, based on the ton of 2,240 pounds, would weigh 32.666 grammes, and accordingly as we took fractions or multiples of it in assaying ores, so would our resultant beads of the precious metals be fractions or multiples of an ounce per the long ton.

Those who may object to the metric system can still use the assay ton system by making the unit a weight of 291.66 grains troy, or 326.66 grains troy. In actual work it has been found that 1-5 A. T. of the gramme system, equals 5.83 grammes, equals 90.01 grains troy, is a good quantity of ore to use in an assay. An equivalent amount, or nearly so, in the grain assay ton system first given, would be ½ A. T. equal to 97.22 grains.

The adoption of any system of assay ton weights avoids long calculations and the use of tables. By employing a whole number for the weight, then dividing the result by the said number and multiplying the quotient by 29,166 or 32,666, we obtain the same figures as by the assay ton system, but this necessitates considerable multiplication or the use of previously prepared tables.

MECHANICAL PROGRESS.

Destruction of Steam Boilers.

The Dusseldorf Soc. for supervision of steam boilers consider the following to be the chief causes for the destruction of steam boilers: Corrosion of steam boilers on the outside is principally due to the action of the heating gases and of the moist masonry. The products of combustion very frequently contain sulphurous acid, which, in contact with moisture, is gradually converted into sulphuric acid, and as such, corrodes the iron. The moisture of the brick work causes direct rusting. With regard to interior corrosion, the following points are to be noted: When an upper and lower boiler are used, the feed water is let into the latter, which the fire gases reach last, and, therefore, is not so hot as the other. It is often noticed that the separate plates of this boiler are pock marked with little grooves. When fresh water containing air is warmed, little bubbles of air containing much oxygen form, and as there is very little motion in this part of the boiler, they adhere to any rough spots on the iron and are destructive to it. It is easy to see that rough iron is attacked more readily than smooth, and, of course, the action is most powerful in the grooves themselves. If steam bubbles attach themselves to any spot whatever in a steam boiler, where the temperature is not very high from its being heated with hot gases only, rusting will take place. Here, too, the atmospheric air in the feed water would be the destructive agent. Hence, if care is taken to keep the water in motion circulating around in the boiler, the chief cause of internal corrosion will be for the greater part neutralized.—*Polyt. Noti.*

FINISHING FILES BY SAND BLAST. It may be of interest to state that the chief value of the well known sand blast method of sharpening files does not consist so much in its application to the sharpening of old files, but in finishing new files that have just been cut. Experiments have shown that such files, submitted to the action of a sand blast, exhibit greater resistance to wear and greater cutting power than files as ordinarily made. In order, however, to obtain definite figures as to their superiority, a series of experiments were made some time ago, yielding the following results: A new bastard file some fourteen inches long was finished on one side according to the sand blast method, while the other side remained in its ordinary state. Still another file of the same dimensions, and which had been in use for some time, was sharpened by a sand blast, and three pieces of gun metal of exactly the same size and the same composition were then operated upon, until finally one of the three cutting surfaces of the two files were found useless for further work. They were then used on cast iron, wrought iron and steel, and in each case it was found that the ordinary file gave out long before the others. The ordinary file was completely worn out during the trials, while those which had been subjected to the sand blast were still in condition for further use. It may also be remarked that Mr. Friedr. Krupp, of Essen, Germany, has introduced the method in his works.

ROLLING COLD IRON.—The process of rolling cold iron owes its discovery to merest accident. A foundryman, a workman at the rolls, neglected to take his tongs from a bar of heated iron in time, and they were carried through the rolls. Much to his surprise, the tongs, instead of being broken in passing through the rolls, were reduced to the same gauge as the heated bar, and shone like steel. The workman called the attention of the superintendent to what he thought was merely a "funny" circumstance; but the superintendent jumped at the conclusion that if it were possible to roll iron cold once it could be done again. He commenced to experiment, and had not gone far before he discovered that cold rolled iron was in every respect the equal of steel for shafting purposes, and in some respects it is superior, as it is more easily turned to any desired size than steel. Other discoveries followed this, and the process for rolling iron cold was patented.

HOW TO ANNEAL SMALL CASTINGS.—A correspondent of *Cotton, Wool and Iron* says: Have some cast iron boxes made, say six inches wide by six inches deep, by twelve inches long and one half inch thick, without covers. In these boxes first put a layer of cast iron turnings, about one half inch thick; then a layer of castings, packing them as close as possible, and fill all the space between the castings with turnings. Fill the box in the above manner with castings to within one inch of the top, which fill even full with the turnings. Heat the whole to a cherry red, and let them cool off slowly. I have repeatedly annealed castings that were not over three thirty-seconds of an inch in thickness, and "as hard as glass," in the above manner with perfect success.

GROWING COMPETITION OF THE GAS ENGINE. —It is stated that English shops engaged in the manufacture of the lighter class of steam engines are receiving very few orders for such work. It is also stated that this new falling off in such orders is mainly due to the increasing demand for improved gas engines of small capacity, the manufacture of which is rapidly increasing. The gas engine in England, at any rate, is gradually, but surely, taking the place of the steam engine, where only a small driving power is required.

CUTTING STEEL WITH SOFT IRON. It is well known that the hardest steel can be readily cut with soft iron. A grindstone may also be most readily made true with a bar of soft iron. The *Northwestern Miller* explains the philosophy of the thing as follows: "The discovery is as old as Tubal Cain, the first known cunning worker in brass and metal. It is on the same principle that the barber cuts the superfluous steel from the edge of his razor, by the same principle of abrasion, without ascribing any magnetical attraction to his strap. A small, sharp stream of water never fails to cut the hardest rock it meets with; in short, all rivers form their beds by the same power of abrasion, or friction. Suppose a plate was six, eight or ten inches in diameter, and only one-twentieth of an inch thick, it would occupy a very small line on the material to be cut; every particle of that line would be subjected to many yards of particles, by the rotary motion of the cutting wheel, and no two particles of the line could be touched at the same time by any round wheel; if the wheel were hard it would not cut so well, but glide over; but the file, or saw, being hard, makes no difference here, because each particle, on being subjected to the current of friction, soon becomes softened, and serves to compose the flash of sparks seen on such occasions."

IS IT POSSIBLE TO CAST A CHAIN?—A correspondent of *Cotton, Wool and Iron* asks this question, "Is it possible to cast a chain, and if so, how should the pattern be made and molded? Although we are living in an age when iron is being drop forged and welded in all variety of shapes, still all this is threatened to be set aside by the facility with which steel is being cast into every variety of forms, and if a chain can be cast from one kind of metal without much trouble, why not of cast steel, which is both strong and enduring, and set aside the trouble of forging and the difficulties in welding the short links for a chain?" In this connection we may remark that a die for welding links has recently been patented by Mr. Frank A. Iddings, of Warren, O. The die relates specially to the welding of links used in railroad car couplings. By a peculiar construction of welding dies, increased facility is afforded for opening the dies when necessary to remove the welded link. A finishing die is likewise provided, which operates in connection with the welding die.

CASE HARDENING.—Probably no better method of case hardening can be employed than that of packing the article to be hardened in a box or crucible with the carbonizing materials—ground bone or animal charcoal—luting the vessel tight, and exposing it for several hours to a red heat. In large establishments, where case hardening is a daily duty, ovens and special appliances are always at hand. But when there is only one piece to be treated, and the necessity for case hardening occurs only occasionally, a simpler method may serve. It is well to keep on hand for this purpose a powdered mixture of prussiate of potash and bone black or animal charcoal, in equal proportions by quantity. This may be applied to the red hot iron, either as a powder, or as a paste made with oil or even mixed with water.

PROGRESS OF AMERICAN CARRIAGE INDUSTRY.—A thoroughly made American pleasure carriage could not be had in this country in 1860. We were obliged to import the springs and other steel work and most of the textile trimmings; but as we now make as good steel as we import, and produce our own silks, fringes and tassels, we build our own carriages. Under protective duties we build, in the single State of Ohio, more pleasure carriages annually than are produced in Great Britain and France combined, and the returns of the census show the existence, in 1880, of more than 43,000 establishments for the manufacture of carriages and smithing, which employed, in that year, 105,000 hands, to whom were paid as wages, more than $38,000,000.

EFFECTS OF COMPRESSION ON THE HARDNESS OF STEEL.—Mr. Lan reports that at the works of Saint Jacques, at Montlucon, France, the method of compressing cast steel has been applied on a large scale. The process consists of submitting the molten metal to the action of an hydraulic press which can exert a pressure of from about 15,000 to 22,000 pounds per square inch, the pressure being kept up until the ingot has solidified and cooled. The result of this method is a great increase in the strength of the metal.

SUPPOSE we wish to know the largest square that can be cut from a circular sheet of given size. To ascertain without measuring, multiply the diameter by 0.7071, and we have the side of a square that will be contained in the circle. This is a useful rule for all trades. Machinists very often have occasion to use it; so do boiler makers and lumbermen.—*Mechanical Engineer.*

LUBRICANT FOR HEAVY BEARINGS.—The following lubricant for heavy bearings will be found excellent: Dissolve the best white lead in good machine oil, make it pretty thick, take all the hard and clotty substance away, then add the remainder, and you will find this a good lubricant.

AMERICAN PLUMBING.—British architects appear to concede that plumbing and other sanitary arrangements of American houses are far better than those of the English.

SCIENTIFIC PROGRESS.

Photographing the Solar Corona.

Huggins has succeeded, by the aid of colored glasses and potassic manganate, in photographing the corona. Using a Newton three-inch telescope, with a focal distance of three and a half feet, he obtains a very distinct photographic image of the sun, without any perceptible defect. When the exposure is very rapid, there can be seen around the sun, under suitable conditions of illumination, the interior corona, which is more regular in form than the exterior corona, and which extends about a quarter of a solar diameter beyond the sun's image. An exposure a little less rapid produces a reversal of the photographic image of the sun; the interior corona is absorbed in the exterior, which appears black, as in a negative proof. If the exposure is a little longer, the reversal is produced both in the solar image and in the corona, but not in those parts of the plate which are affected by the atmospheric light alone. Afterwards the plate represents the corona in white, as in a positive proof, and the atmospheric light in black. Then the straight and curved lines, and the other varied forms which characterize the corona, can be easily traced. Captain Abney has carefully compared these plates with those which were taken during the last total eclipse. He does not doubt that Huggins is able to photograph the corona at any time without waiting for eclipses, which occur only fifteen times in a century. The new method will enable observers, especially in southern climates and at high elevations, to make this phenomenon, which is one of so great importance in solar research, the subject of daily study.—*Comptes Rendus.*

A REMARKABLE SAURIAN.—The Brazilian Minister at La Paz, Bolivia, has transmitted to his government at Rio Janeiro, photographs and drawings of a most extraordinary saurian, lately killed near La Paz, but only after receiving thirty-six rifle balls. The dried body of the monster has also been preserved. The body is twelve meters long from snout to point of the tail, which latter is flattened. Besides the anterior head, it has four meters behind, two small but completely formed heads (?) rising from the back. All three have much resemblance to the head of a dog. The legs are short and end in formidable claws. The legs, belly and lower part of the throat appear defended by a kind of scale armor, and all the back is protected by a still thicker and double cuirass, starting from behind the ears of the anterior head and continuing to the tail. The neck is long, and the belly large and almost dragging on the ground. Professor Gilveti, who examined the beast, thinks it is not a monster, but a member of a rare or almost lost species, as the Indians in some parts of Bolivia use small earthen vases of identical shape, and probably copied from nature. Mr. William E. A. Axon, in a note giving the above to the *Journal of Science*, says: "If this account should prove to be accurate, it would form a counterpart to the etching of the mammoth, which forms so interesting a memorial of prehistoric art."

FRENCH ACADEMY PRIZES.—The French Academy of Sciences has recently published a list of the prizes offered by them for essays on scientific subjects during this year and until 1886. In applied mechanics the Fourneyron prize will be given for the best "study, both theoretical and experimental, of the different methods of transporting force to a distance." A grand prize will be awarded in 1884 for a mathematical solution of the problem "to perfect in some important point the theory of the application of electricity to the transmission of power." The prize will consist of a medal valued at 3,000 francs. The memoirs must be submitted to the secretary of the Academy before June 1, 1884, and should be anonymous, but accompanied by a sealed envelope with the real name and address of the author. The Bordin prize, which was not awarded this year, is carried on to 1885, and memoirs must be lodged before June 1st of that year. The subject is a "research into the origin of electricity in the atmosphere, and the causes of the great development of electric phenomena in storm-clouds." The prize is a medal worth 3,000 francs.

A NEW FOOD.—According to the *Chemiker Zeitung*, M. Muller has evaporated skimmed milk in a vacuum, so as to obtain a permanent product, which can be preserved for many months in a dry atmosphere, and which has valuable alimentary properties. He thinks that it may be of great use in pastry, and in various kinds of baking, and the best sugar of milk can be made from it. The skimmed milk which is collected in dairies and cheese factories, is usually given to animals or wasted in sewage; it contains, however, large quantities of salts, and particles of butter and caseine, which can be utilized by Muller's method.—*Rev. Scientif.*

THE QUESTION is being seriously asked whether the increasing transfer of iron from the earth's interior to its surface, can have any influence upon the weather. It seems that, at least, the vast masses of iron that are being spread out in railways, bridges, etc., must affect the electric currents which move about the earth. Perhaps the cyclones becoming more frequent and destructive every year, and which are now recognized as electric storms, may be traced to this cause.

TO DETERMINE THE QUANTITY OF MOISTURE IN WALLS.—Dr. W. Hesse, a district medical official at Schwarzenberg, has communicated to the technical press of Germany a simple process for the quantitative definition of the free water which may be contained in a wall. For the carrying out of this process it is necessary to have a number of small glass flasks with glass stoppers. These should be of about one-half to five-eighths cubic inch capacity, and of known weight. A small portion of mortar sufficient to fill one of the flasks is taken from the internal surface of the wall by boring with a tool specially constructed, and also by scraping from the wall, a piece of paper being held underneath. After the removal of any large impurities particles the flask is filled rapidly, and well closed with an india-rubber stopper. In the laboratory the flask itself, as well as the inner surface of the neck, is carefully dusted, the glass stopper is inserted and the flask weighed. It is then exposed in a drying oven to a temperature of 212 to 230 F. until the mortar is completely dry, this process usually taking several hours. The flask is then allowed to cool in an apparatus specially designed for the purpose, and is again weighed. By deducting the weight of a vessel (as previously ascertained), the difference between the weight of the mortar before and after drying is arrived at, and the percentage of moisture is thus established.

PHOTOGRAPHING THE VOCAL ORGANS.—Some attempts have been made in London to photograph the human vocal organs in the act of singing. The principal object was to obtain a picture of the ligaments known as the vocal cords, which are situated at the top of the larynx. These can be viewed in the laryngoscope, a small mirror, which when placed at the back of the throat serves at once to reflect light upon the membranes, and to form an image of them visible to the observer. With the aid of this instrument numerous observations have been made upon singers, and most valuable information has been collected, but all previous efforts to obtain a photograph by substituting a camera for the observer's eye have entirely failed. The difficulties were overcome by the use of a powerful Siemens electric lamp, supplied by a dynamo machine. By means of this light some excellent photographs were obtained of the laryngoscopic image. The patient in each case was Herr Belnke, at whose instance the experiments were made.

ELECTRICITY.—The following not over well authenticated paragraph is floating about in the sea of newspaperdom: The most astonishing claim yet made in behalf of electricity is, that it has been proven possible to convey by it vibrations of light, so that it is practicable not only to speak with a distant friend, but to see him. According to the Otago *Times*, Dr. Guidrah, of Victoria, has invented an apparatus, called by him the electroscope, which accomplishes this. The paper in question says that a public test of this instrument was made in Melbourne in the presence of some forty scientific and public men. Sitting in a dark room, they saw projected on a large disk of white burnished metal the race-course at Flemington, with its myriad hosts of active beings. Each minute detail stood out with perfect fidelity to the original, and as they looked at the original picture through binocular glasses, it was difficult to imagine that they were not actually on the course itself, and moving among those whose actions they could so completely scan.

POWER OF THE WAVES.—The tremendous power of the sea waves has been illustrated at Wick, on the extreme northeast coast of Scotland, where a breakwater was being built. It may give an idea of what wave power really can do. It was found that stones of ten tons weight were as pebbles to the waves, which have been measured to be fifty-two feet from the crest to the bottom of the trough. The outer end of the breakwater, where the storm beats most violently, was built of three courses of 100-ton stones, laid on the rubble foundation; next above these were three courses of large flat stones, and upon these a mass of concrete, built on the spot, of cement and rubble. The end of the breakwater was thought to be as immovable as the natural rock, yet the resident engineer saw it yield to the force of the waves, and swing around into the troubled waters inside the pier. It gave way, not in fragments, but in one mass, as if it were a monolith. The displaced mass is estimated to weigh about 1,850 tons.

RAINBOW GLASS.—The soap-bubble colors upon glass are produced by a vapor, which is deposited on the hot glass before it goes into the annealing oven. The vapor comes from a mixture of protochloride of tin, carbonate of baryta, and carbonate of strontium. It is said that the workmen of a Bohemian manufacturer, wishing to celebrate his arrival, kindled some Bengal lights in the annealing furnaces, and the pieces which were in the furnaces all became iridescent. The colors can be removed by hard rubbing. Messrs. Clemandot and Fremy produced a pearly luster, like that of shells, by means of different chemical agents, chlorhydric acid among others, under pressures of four, five, or six atmospheres. They were thus able to imitate the magnificent glasses of antiquity, which have become iridescent through the lapse of time.

A KNOWLEDGE of drawing and use of tools is of incalculable worth in all trades.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

COMPANY.	LOCATION.	No.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Alta S M Co.	Nevada.	26.	25.	July 3.	Aug 7.	Aug 27.	Wm. H. Watson.	302 Montgomery st
Andes S M Co.	Nevada.	22.	25.	June 27.	Aug 2.	Aug 22.	B Burris.	309 Montgomery st
Argenta M Co.	Nevada.	16.	25.	June 21.	July 24.	Aug 17.	E M Hall.	327 Pine st
Albion Con M Co.	Nevada.	14.	50.	July 17.	Aug 20.	Sept 8.	A W Havens.	309 Montgomery st
Con Virginia M Co.	Nevada.	19.	20.	July 11.	Aug 15.	Sept 5.	A W Havens.	309 Montgomery st
California M Co.	Nevada.	8.	20.	June 26.	Aug 4.	Sept 3.	C P Gordon.	309 Montgomery st
Caledonia M Co.	Nevada.	39.	20.	June 15.	July 19.	Aug 9.	R Wegener.	414 California st
Excelsior D G M Co.	California.	22.	40.	June 16.	July 23.	Aug 10.	T J Wattson.	114 Davis st
Excelsior D G M Co.	California.	1.	5.00.	June 5.	July 9.	July 26.	W. Cunningham.	326 Montgomery st
Exchequer M Co.	Nevada.	19.	20.	June 14.	July 19.	Aug 9.	C E Elliott.	327 Pine st
Excelsior Water and M Co.	California.	5.	60.	July 6.	Aug 11.	Sept 3.	W J Stewart.	215 Sansome st
Grand Prize M Co.	Nevada.	14.	25.	June 25.	July 27.	Aug 20.	E M Hall.	327 Pine st
Gould & Curry M Co.	Nevada.	45.	50.	June 15.	July 20.	Aug 13.	A K Parbrow.	309 Montgomery st
Holmes M Co.	Nevada.	7.	30.	June 27.	July 30.	Aug 21.	C T Bridge.	224 California st
Hale & Norcross M Co.	Nevada.	77.	50.	June 7.	July 11.	Aug 2.	S F Lightner.	309 Montgomery st
Independence M Co.	Nevada.	11.	30.	May 25.	June 28.	July 23.	J W Pew.	310 Pine st
Justice M Co.	Nevada.	39.	10.	July 9.	Aug 13.	Sept 3.	R E Kelly.	419 California st
Mexican M Co.	Nevada.	23.	50.	July 17.	Aug 22.	Sept 11.	C L McCoy.	309 Montgomery st
Martin White M Co.	Nevada.	15.	25.	July 9.	July 11.	Aug 8.	J J Scoville.	309 Montgomery st
Red Hill H M Co.	California.	8.	05.	May 24.	June 26.	July 23	E Hestres.	328 Montgomery st
Tip Top M Co.	Arizona.	6.	25	May 29.	July 6	Aug 6.	H Deas.	309 Montgomery st
Union Con M Co.	Nevada.	25.	50.	July 17.	Aug 21.	Sept 11.	J M Buffington.	309 California st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Alexander M Co.	Nevada.	2.	1.00.	June 20.	Aug 6.	Aug 27.	J K Warren.	307 Montgomery st
Alaska M Co.	California.	2.	4.00.	June 7.	July 9.	July 30.	A Judson.	320 Sansome st
Bald Mountain M Co.	California.	2.	3.	June 26.	July 27.	Aug 30.	L Shannahan.	125 First st
Continental C & I Co.	California.	1.	05.	May 26.	July 5.	July 24.	W E Greene.	309 Montgomery st
Champion M Co.	California.	12.	10.	June 4.	July 34.	Aug 11.	T Wetzel.	522 Montgomery st
Eintracht G M Co.	California.	2.	05.	June 12.	July 7.	Aug 3.	H Kunz.	209 Sansome st
Genesee M Co.	California.	1.	40.	June 20.	July 30.	Aug 22.	J Stedtfeld.	419 California st
Goodshaw M Co.	California.	14.	10.	June 6.	July 14.	Aug 7.	C C Harvey.	309 Montgomery st
Gorilla M Co.	California.	1.	10.	June 1.	July 7.	Aug 1.	A A Enquist.	436 Montgomery st
Hazard Gravel M Co.	California.	7.	1.	June 20.	July 21.	Aug 10.	J T McGeoghegan.	318 Pine st
Hamburg M Co.	Nevada.	8.	25.	May 24.	July 2.	July 24.	D A Jennings.	401 California st
Homeward-bound M Co.	California.	1.	05.	May 23.	July 10.	July 28.	A Bowie.	314 Montgomery st
Lima Con M Co.	Arizona.	6.	05.	June 11.	July 18.	Aug 6.	R D Hopkins.	436 Montgomery st
Pacific M & Refining Co.	California.	1.	25.	June 20.	July 25.	Aug 15.	J W Bevilng.	413 California st
Roma Union M Co.	Nevada.	2.	02.	June 18.	Aug 6.	Aug 27.	F. X. Simon.	518 Sansome st
San Miguel Con M Co.	Mexico.	2.	1.00.	Apr 28.	June 4.	July 22.	C G Brooks.	210 Front st
West Bruuch Feather River M Co.	Cal.	1.	01.	July 16.	Aug 20.	Sept 10.	A B Paul.	328 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Benton Con M Co.	Nevada.	W H Watson.	302 Montgomery st.	Annual.	July 25
Champion M Co.	California.	R Burris.	309 Montgomery st.	Annual.	July 30
McMillan S M Co.	Nevada.	J Moriello.	328 Montgomery st.	Annual.	Aug 1
Monumental Bar G M Co.	California.	J W Pew.	310 Pine st.	Annual.	July 27
Silver Hill M Co.	Nevada.	J W Pew.	310 Pine st.	Annual.	July 26

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Kentuck M Co.	Nevada.	J W Pew.	310 Pine st.	10.	June 20
Navajo M Co.	Nevada.	J W Pew.	310 Pine st.	25.	May 14
Silver King M Co.	Arizona.	J Nush.	315 California st.	25.	June 15
Standard Con M Co.	California.	Wm Willis.	309 Montgomery st.	25.	June 12

Table of Highest and Lowest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING June 27.		WEEK ENDING July 5.		WEEK ENDING July 12.		WEEK ENDING July 19.	
Alpha	1.75	2.00	1.80	1.50	2 00	2.00	2.00	2.30
Alta	.45	.60	.40	.45	.75	1.00	.65	.75
Andes	.55	.60	.45	.50	.45	.50	....	.45
Albion	.35	....	....	.45	.40	.50	.35	.40
Argenta	.15	.20	.10	.15	.05	.10	....	.05
Atlas	....	....	....	....	....	....	....	....
Belcher	1.10	1.20	....	1.15	1.15	1.25	1.20	1.25
Belding	....	....	....	....	....	....	....	....
Best & Belcher	4.05	4.50	4.05	4.20	4.25	4.45	4.15	4.40
Bullion	.90	.95	....	.75	....	.85	....	.85
Bechtel	....	....	....	....	....	....	....	....
Belle Isle	.45	.60	....	.50	.60	.45	.35	.45
Bodie Con	.90	1.05	.80	.90	.60	.80	.60	.80
Benton	.05	.15	....	....	....	.25	.15	.20
Bodie Tunnel	....	....	....	....	....	....	....	.30
Caledonia	.10	....	....	....	....	....	....	.25
California	.10	.25	....	....	.10	.15	.10	.15
Challenge	.40	....	....	.30	....	....	....	....
Chollar	2.75	2.90	3.00	3.85	3.30	3.75	3.35	3.80
Confidence	2.00	2.40	2.10	2.25	2.05	2 25	2.00	2.15
Con. Imperial	.05	.10	....	.10	....	.10	....	....
Con. Virginia	.45	.55	....	.45	....	.50	.35	.55
Crown Point	1.25	1.45	1.25	1.30	1.40	1.45	1.30	1.45
Day	.60	.85	.50	.55	....	.50	....	.50
Elko Con	.20	.25	....	.25	....	....	....	.25
Eureka Con	5.00	8.00	4.10	5.00	4.75	6.00	4.50	5.00
Eureka Tunnel	....	.70	....	.60	....	.60	....	....
Exchequer	.20	.30	....	.25	.20	.25	....	.50
Grand Prize	.05	.25	.05	.10	....	.05	....	.05
Gould & Curry	2.50	2.80	2.25	2.45	2.40	2 50	2.40	3.05
Hale & Norcross	5.25	7.00	6.00	7.00	5⅞	6¼	6¼	6¾
Holmes	....	....	....	....	....	....	....	....
Independence	.35	1.05	....	....	....	.90	....	.50
Julia	.10	.15	....	....	....	.15	....	....
Justice	.15	.20	....	....	.20	.25	....	....
Jackson	....	....	....	....	....	.35	....	.50
Kentuck	2.50	....	....	....	....	....	....	2.60
Martin White	.05	....	....	....	....	.05	....	....
Mono	....	....	....	....	....	....	....	....
Mexican	2.80	3.05	2.90	3.00	2.90	3.15	2.60	2.95
Mt. Diablo	3.00	3.25	....	....	4.50	6.00	5.00	5.50
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	....	....	....	....	....	....	....	....
Northern Belle	6.50	6¾	....	6¾	6.75	6¾	7.00	....
North Noonday	....	....	....	....	....	....	....	....
Navajo	2.25	4.20	2.90	3.20	2.40	3.20	2.85	3.10
North Belle Isle	.35	.50	....	....	....	.30	....	.35
Occidental	1.65	1.90	....	1.25	....	....	....	1.50
Ophir	2.25	2.90	2.25	2.55	2.10	2.65	2.30	2.55
Overman	.35	.40	....	.30	....	.40	.30	.35
Opp	....	....	....	....	....	....	....	....
Potosi	1.25	1.40	1.25	1.40	1.45	1.55	1.50	1.70
Pinal Con	....	.80	....	....	....	.60	....	.65
Savage	1.90	2.30	1.95	2.10	1.95	2.05	2.10	2.45
Sea Belcher	....	....	....	....	....	3.00	....	....
Sierra Nevada	3.60	4.50	3.55	3.80	3.90	4.45	3.65	4.10
Silver Hill	....	.05	....	....	....	....	....	....
Silver King	10	10¾	....	10	8.50	9.75	6¾	6¾
Scorpion	.60	.70	....	....	.60	.70	.55	.65
Tuscarora	....	....	....	....	....	....	....	....
Union Con	4.25	5¾	4.40	4.80	4.90	....	4.75	4.95
Utah	2.80	4.90	2.75	2.80	2.65	2.85	2.40	2.75
Ward	....	....	....	....	....	....	....	....
Wales	....	....	....	....	....	....	....	....
Yellow Jacket	3.60	4.15	3.65	3.90	3.75	4.05	3.75	4 00

Sales at San Francisco Stock Exchange

THURSDAY A. M., July 19.		AFTERNOON SESSION.	
300 Argenta	.05¢	300 Alta	.75c
100 Albion	.35c	100 Alpha	.2.20
125 Bodie Con	.65c	300 Argenta	.05c
1070 Chollar	3 70	250 Albion	.35c
300 Crown Point	1.30@1.35	40 B. & Belcher	.4.15
780 California	10¢	500 Belle Isle	.40c
50 Con. Virginia	.40c	660 Chollar	.3.55@3.65
30 Eureka Con	.47	200 Con. Virginia	.40c
1590 E. Mt. Diablo	.05¢	40 Crown Point	.1.30
200 Gould & Curry	.3	5 Eureka Con	.44
300 Grand Prize	.05¢	200 Eureka Tunnel	.60c
420 Hale & Nor	.6⅞@6¾	250 Exchequer	.40c
100 Independence	.40c	355 El Dorado	.35c
150 Mexican	.2.80	300 Gould & Curry	.2.90@2.95
100 Navajo	.3	2050 Grand Prize	.05c
50 Ophir	.2.35	250 Hale & Nor	.6¾@6¾
50 Occidental	.1.65	100 Navajo	.3.10
100 Overman	.35c	120 Ophir	.2.35
725 Potosi	.1.55	230 Overman	.30c
300 Savage	.2.35c@2.40	500 Potosi	.1½
600 Sierra Nevada	.3 65	40 Silver King	.6¾
1100 Scnator	.15c	130 Sierra Nevada	.3.70
10 Utah	.2.40	150 Union Con	.4¾
650 Union	.4.70@4¾	10 Utah	.2.35
340 Yellow Jacket	.3.65@3¾	300 Yellow Jacket	.3.70@3.80

ENGLISH gold coin is said to have become so worn that it will cost $4,000,000 to restore the $25,000,000 in circulation.

Mining Share Market.

Operations in mining shares during the week are without interest, the market has been feeble and inactive with few transactions, and prices of the preceding week but little changed. As usual, accounts from the leading comstock mines continue hopeful. In the absence of new ore developments the long hoped for "boom" seems as far off as ever, and since "hope deferred maketh the heart sick" that organ with the expectant crowd must by this time be extensively diseased, nor is the outlook at all encouraging. Without any new finds, and the two principal "bonanza" magnates away in Europe, the prospects for a more lively market grows every day "smaller and beautifully less." Meantime, the ranks of the "chippers-in" are being thinned out. The habitues of "Paupers' Alley" grow daily more seedy and dropping off one-by-one disappear from view. The occupation of the chaquer is nearly gone, and the grinding with the curb-stone broker is low, where this decadence is to end without an early strike on the Comstock or a generally "whooping-up" of the chiefs, it is easy to devine—the whole miserable business must inevitably go to the dogs.

Bullion Shipments.

Mt. Diablo, July 12th, $7,633; Bodie, 16th, $3,122; Northern Belle, 12th, $5,513.66; Tiptop, 14th, $4,876; Central City, 16th, $41,000.

PRODUCTION OF GOLD.—The future supply of gold, even for coinage purposes, is beginning to be one of more than common interest. Ancient history is resplendent with the prodigal display of gold by the barbaric peoples of the Orient. Arabia, Egypt and Africa, according to this same authority, were prolific in their production of this precious metal. Pliny states that Cyrus returned from his conquest with 34,000 pounds of gold (about $10,000,000). Alexander the Great brought $100,000,000 in gold from Persia. But at the present time these great fields, so renowned in history, are barren, so far as the production of gold is concerned, and it is evident that Europe can no longer be depended upon to perform any appreciable part in furnishing a supply of gold to meet the demands of the future. Even in this country the statistics of production show a constant and marked decline in gold, although the field is largely extended and mining is more thoroughly prosecuted than ever before.

PAPER STEAMBOATS.—Some of our exchanges are under the impression that a paper steamboat has recently been launched at Pittsburgh. This is a wrong impression. Pittsburgh steamboat builders have not yet got beyond the use of wood, iron and steel in their department of industry. The paper steamboat is not of the present, nor of the past. Further than this, we are not willing to accept any responsibility.—*Am.*

GROWTH OF OAKLAND.—In 1860 the population of Oakland to San Francisco represented a ratio of 1 to 37; in 1870, 1 to 15; in 1878, 1 to 8, and by the school census of 1883, 1 to six.

The digestive organs weakened and worn out by using cathartic medicines, restored by using Brown's Iron Bitters.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

MAHONEY.—*Ledger*, July 14: A favorable change is reported in this mine. Good rock was struck in the 900 level on Monday last. It has every appearance of being permanent, and it is probable that a portion of the mill will be started on it in a few days, when the quality of the ore will be definitely ascertained.

FROM DRYTOWN.—The Palmer, or Black Hill Co. cleaned up $3,000 the other day, that being the result of a run of 21 days.

JACKSON.—Operations have once more come to a standstill at this mine. The miners quit work Sunday morning, and nothing but pumping out water has been done since. The cause of this suspension is that the company was about six weeks behind in the payment of wages. The mine seems to be of a pocketty character, but the pockets encountered so far have not proved extensive nor rich. Some good ore has been met with, but not in quantity to justify the erection of a mill, or the hauling of the rock to a custom mill.

MISCELLANEOUS.—Messrs. Matson, Hagerman and Fleming have their quartz mill about ready to commence operations. The mill is built for 10 stamps, but only 5 have been put in at present. It is located at Red Hill, near Butte City, on the Mokelumne river side of the ridge. Water is conveyed by 300 ft of pipe with a pressure of 150 ft, which will enable the machinery to be run with about 15 inches of water. The mine is close by. The ore body is small—from 12 to 18 inches wide, but it is said to pay big. By pounding a small quantity of rock in a hand mortar they took out $100. About 100 tons of quartz lies on the dump ready for milling, and it is estimated that the yield from this will more than pay all expenses incurred in putting up the mill. They will get to work in a few days. J. Stewart has his 5-stamp mill near Butte City in running order, and started it the other day, but the water supply was hardly sufficient. The Kelly mill is again in operation on rock from Morgan's mine in Murphy's gulch.

Butte.

BIG BEND TUNNEL.—*Mercury*, July 13: The Big Bend tunnel is in about 2600 ft; the work is being pushed vigorously.

BIG BAR.—We were lately shown some specimens of gold, ranging from the size of a pin's head to that of a large pea, taken from the Big Bar drift mine, situated about eleven miles above Big Bend. The mine is the property of D. K. Perkins, of this city, and according to all reports it will turn out one of the richest in the county.

AT YANKEE HILL.—Fred Wellington, living near Yankee Hill, is the owner of a fine quartz lead, from which, he says, ten thousand tons of $15 milling ore can be taken out above the water level, at a cost not to exceed $2 per ton. The ledge is eight ft wide, and the owner thinks the supply of ore is inexhaustible. Mr. Wellington will show his mine to any parties who may wish to examine it. There are many other good leads in the vicinity. Wood and water are abundant, and good roads run to, or within a short distance of many of the mines. One of the great drawbacks to this section of the country is that there is no mill within reaching distance, by which the ore can be prospected. We have no doubt that a mill erected in the vicinity of Yankee Hill, to do custom work, would be a paying investment.

MINES ON BUTTE CREEK.—*Record*, July 14: J. A. Hedges & Co. have struck a blue stratum of gravel coming out of the hills which prospects surprisingly well in coarse gold. John Foley, working two men has taken out in six months nearly three hundred ounces of gold exclusive of expenses. Joe Rice just below the Foley claim, is putting money in the Bank of Butte County every week. William Longley has a very good claim on Boneyard Flat, making $1.50 to every bucket of dirt taken out. Alex. McIntyre, is working his hill claim, and making money, too. W. N. Nesbit, another of our forty-niners, has struck rich diggings opposite Whisky Flat, where he has located a derrick. He thinks Helltown will yet come up to the old palmy days of the past, when he used to take in a thousand dollars every Sunday.

Calaveras.

ABOUT WEST POINT.—*Chronicle*, July 14: The Star of the West mine has been yielding some very rich rock lately. The Haskin's mine is looking more favorable now than for years past. Mining experts and capitalists are here prospecting some of the old mines. Prospects look encouraging for this place. Five tons of ore from the Uno mine in Nassau Valley owned by Sylvester & Co. were recently worked by arrastre process, which yielded $15 75 per ton. The shaft from which the ore was taken is about 27 ft deep, and the vein about two ft wide.

El Dorado.

RICH SULPHURET.—*Republican*, July 12: Mr. Stevens, who is developing a promising gravel mine in the vicinity of Texas hill, has opened up a sulphuret vein of considerable dimensions that is exceedingly rich in gold, assaying away up into the thousands per ton. In some of the small conglomorate pieces as much gold as anything else can be plainly seen.

BLAIR MINE.—The machinery here was started up last week, and the pressure was so great and applied so suddenly, that the large iron spur wheel was made a complete wreck in a twinkling. This injury was repaired by replacing it with a new wheel, and on Monday the works were started up again, and in a few hours a cog was broken in another wheel. A bad beginning.

VARIOUS MINES.—*Mountain Democrat*, July 14: The ditch property at Indian Diggings is reported sold to Alvinza Hayward. Mr. James D. Hague, president of the Mount Pleasant mine, Grizzly Flat, was in town Tuesday and went over to inspect the Gopher-Bowlder mine near Kelsey. We are confident that in such hands this mine would develop into one of the best properties in the State. It is an immense ledge, and even if the ore were of lower grade than it is would pay. The mining business is lively about Garden Valley. John G. Jennings, Jr., of Cleveland, Ohio, one of the owners of the Melton mine at Grizzly Flat, was in town yesterday, for the purpose of making final payment on the purchase of the mine.

Inyo.

THE MINERAL EXPOSITION.—Mr. Woodhull has finished packing the Independence collection of Inyo county ores and minerals, and the whole will be shipped to San Francisco the coming week. The specimens are over 500 in number, and they fill 14 boxes, and weigh about one ton. The specimens are from every district in the county, and every known mine of any value, and comprise samples of gold, silver, copper, and lead. They have been selected with great care, both for their beauty and richness, and we shall be much mistaken if they do not attract much attention when placed on exhibition.

A SALT SPECIMEN.—Sheriff Gregg has contributed a splendid specimen of salt from his salt marsh, near Big Pine, for the Mineral Exhibition. The piece is about three ft by two in size and eight inches thick. The salt has crystallized around and over a sage brush, leaving a portion of the brush partly exposed with the branches covered with salt crystals. It is a fine specimen and will weigh about 100 pounds.

Mono.

BODIE CON.—*Free Press* July 14: During the week ending the 6th instant 61.105 tons of ore were sent to the mill and 159.585 tons were crushed. The average assay value of the pulp was $31.92 per ton; that of the tailings was $4.90 per ton. The shipment of bullion was valued at $3,924.20. There were 101 car loads of ore hoisted from the mine, 72 cars of which were from the workings between the 640 to the 780-foot levels; the remaining 29 cars were taken from the 740 to the 770-foot levels of the shaft. At the 1000-ft level the west crosscut was driven 6 ft; its total length being 289 ft. The north drift, same level, is 294 ft long, a gain of 14 ft since last report. Work on the east crosscut at the 1000-ft level, which was suspended on the 7th of April last, was resumed, and has been driven 9 ft during the week, its entire length being now 370 ft.

VIRGINIA CREEK HYDRAULIC CO.—Bar No. 1 of this Co. was melted Thursday by A. Soderling, the assayer, giving a value of $2000. This company is operating at the old Mono diggings, and but a few days since commenced hydraulicing with a little giant. They have an ample supply of water, and a rich territory to work. They have been quietly getting ready for operations for some time, and there is every prospect that they will add materially to the resources of the county.

Nevada.

MINES IN BRIEF.—*Transcript*, July 14: The ledge in the Sherman Con. mine continues to improve in size and general appearance as the drift is extended south. The 600 level of the Nevada City mine shows a 10-ft ledge, which is the largest deposit of ore ever found in that mine. All of the quartz between the walls, pays well for working. As soon as this level is fairly opened up, sinking will be recommenced.

MINING FOR AGATES.—Capt. Weare, who has for three months past been prospecting for agates in the vicinity of Newtown, recently struck a ledge that yields some very beautiful specimens of various kinds, including chalcedony, carnelian, pure crystal, common moss agates, etc. He finds the deposits in pockets. His claim is at the head of Rush creek, three and a half miles west of this city.

MINERS DISCHARGED.—Since the breaking of the English dam 70 miners have been discharged from the Milton Company's mines at French Corral and only four remain in employ. As the dam can not be reconstructed in time to furnish any more water this season, the operations of the mine must be suspended, and the miners must seek elsewhere for employment. If repairs are not made to the dam this season there will be no water for next summer's work. As the company has made no sign as to what will be done, there is a feeling of great uncertainty among the residents below San Juan, and there are fears of a general business stagnation.

Placer.

IN FULL BLAST.—*Times*, July 14: The iron furnace at Hotaling are now using 80 bushels of coal to the ton of iron. They are now turning out 24½ tons of iron per day, and one day 30 tons were turned out. Last year 185 bushels of coal were used to make one ton of iron, and the result was only about half as much was produced as at present. There are now 165 men employed about the mine, and they get from $2.50 to $3 per day. The company issue scrip to their employes in any amount from 5 cents to $5 and issue it as often as it is wanted. This scrip is good anywhere in the town of Hotaling, as it will buy breadstuffs at the stores. None of the employes are compelled to trade at the company's stores. The mine is in better condition than it has ever been, and woodchoppers and teamsters are in demand there.

Plumas.

STARTED UP.—Greenville *Bulletin*, July 11: On Saturday last the new mill on the Premium mine was started up for the first time. The mill machinery was made at the Greenville Iron Works, and is as thorough in finish as it is complete in detail. The owners of this mine are all working men; during the past five years they have patiently an steadily worked to develop their property. They did not attempt to build a mill till they had first satisfied themselves that there was ore enough to warrant such a step, and it is to be hoped that their most sanguine expectations may now be more than realized. It is reported that Rev. Colin Anderson has struck a rich ledge of gold and silver bearing quartz on Eagle creek, in Roop county, Nevada.

San Bernardino.

MINING NOTES.—*Calico Print*, July 14: The Oriental are going down on the 300 level. Steam hoisting works running smoothly and a rich deposit of ore has lately been found; bullion prospects are looming up in this mine. Taggart has struck rich ore. Four tons of first-class milling at $534 per ton, and four tons second-class at $200. That bonanza of a mine the King, yet continues to roll out the silver thousands, and its black hive of a hill fairly hums with the busy workers down in the deep drifts. To the Oro Grande mill 40 miles away goes daily 20 tons of its rich ore. Ten tons of first-class ore from the Blackfoot mine, have been hauled to the station to be shipped to San Francisco. Ten tons more of what is considered to be $200-ore, remains on the dumps. The Garfield mine is coming out brilliantly, striking the rich ledges in every direction. The Bismark is still looking well. They have a 20-ton ship-

ment of ore ready for the mill. Last milling, 25 tons at $250. Messrs. Greer & Barrett of the O. K. mine, have lately developed some very fine ore, and will this week ship to the Pioneer mill five tons. This mine bids fair to stand with the best in our community. The Thunderer, ever indicative of its name, is booming night and day. The Humbug mine is laid up for cool weather. It has about a thousand tons of ore on the dumps. Invincible still at work with favorable returns. Hobbler, Alhambra and Odessa continue to report favorable. The Mammoth is vigorously at work in several new rich ledges. Several tons of very rich ore from the Snow Bird is being milled.

Shasta.

ABOUT WHISKEYTOWN.—*Courier*, July 14: The Phœnix mines show some good rock the Bell and Hubbell at Grizzly Gulch is also looking well. The Banghart continues to turn out the big clean-ups and is really becoming a most wonderful property, and the best of it is that the unearthing these nuggets is likely to become a prominent business. Mr. Stocking the superintendent, is working the claim in an economical, but at the same time in a thoroughly business-like manner. The Banghart will yet create a sensation in mining circles.

BACKBONE CREEK.—The Chinese are beginning to scatter over the hills, along the creeks, and wherever a sign of the precious metal can be found. As the railroad approaches our county, more parties from abroad are coming in to look at our mines. We have had many visitors lately who have gone away with a favorable impression of the gold and silver producing quality of the claims they have visited, and no doubt we shall hear from them shortly. The silver belt commencing at a point three and a half miles north from here extends about forty miles below, and seems to be the principal attraction.

Sierra.

COLUMBO MINE.—*Tribune*, July 12: This property is reported to have been sold. J. P. Deidesheimer bonded it several months ago for $20,000 and it is through his efforts that a company was formed to secure the mine. A force of men have been engaged here for some time past under the management of L. Berger and the prospects are flattering for opening out a big paying property.

THE SIERRA BUTTES.—This company is pushing ahead work on the foundation of the new mill to be built below No. 9 tunnel, on the river. They are doing an immense amount of dead work this year. Two hundred thousand dollars will probably be expended before any returns can be realized from the lower levels of the mine. It is reported that the company has found it necessary to levy an assessment recently.

ANOTHER BIG HAUL.—The Bald Mountain Extention Co. are working to an advantage in the South Fork ground at Forest City. Ninety-four ounces of dust was the result of last week's run. The South Fork Co. has already declared two dividends.

Trinity.

CLEANED UP.—*Journal*, July 14: Many of the mines in Trinity County have already cleaned up for the season while others are just concluding that operation. As nearly as can be learned at the present, the gold yield will fall considerably short of what is considered an average, attributable to the exceeding dryness of the winter 1882-3. For the quantity of gravel washed, the yield is considered excellent. Miners will generally go on and fix up their claims for next season, the prevailing belief being that it will be a wet one.

QUARTZ.—The farther down they go on the Blackmore ledge, the wider and better it gets. The first 16½ tons of rock produced $2500 while the last crushing of a little less than 16 tons ran close on to $3000. Water has given out for this season, but the work of getting out rock and developing the mine will continue and everything be put in first-class order for running when water comes again. Quartz prospects in Trinity are more promising than in any other section of the Pacific Slope. Deadwood district is producing its thousands every week and new mines are being discovered with a frequency that is most encouraging. Bullychoop district is coming to the front with several well developed and good paying mines proven, and others which give promise of good results in the near future. At East Fork but little work has yet been done, yet it shows that the ledges in that section are rich enough to pay well from the very beginning. Just at the present but little crushing is being done owing to the lack of water for running arrastras, but rock is being taken out and piled on the dump ready for crushing as soon as water comes. New mines are being discovered, and new arrastras erected all the time, from which we expect to hear good reports another season.

NEVADA.

Candelaria District.

NORTHERN BELLE.—*True Fissure*, July 14: There has been very little change in the appearance of the mine since the date of the last report. The work in the mine has been much interfered with in consequence of the celebration. About sixty tons of ore of fine grade are being extracted and sent to the mill daily. Both mills continue to run steadily and are accomplishing good work. The shipments of bullion on July account to the 12th inst. amounted to $14,326.49.

MOUNT DIABLO.—The stope near winze No. 1, below the third level, shows a foot of $70 ore that looks promising. A little $150 ore is being taken from the first level near the shaft. The bullion shipments for the week were: $4,243.36 on the 6th inst., and $9,163.79 on the 9th.

COLUMBUS CON.—The new hoisting works have reached completion, and will soon be out of the hands of the carpenter and machinist. The roof of the building and the smokestack are plainly visible from the town of Metallic, and look quite imposing as they rise above the intervening hill. The roof of the works is one continuous shed. A fine cupola surmounts the apex and from it shoots a nice flagstaff. The size and height of the building afford ample room for the machinery and gallows frame, as well as comfortable quarters for a carpenter shop. The hoisting engine is the largest in the camp, being the one formerly used in the Fairfax works, at Virginia City. The hoisting cables are flat, three inches wide, and each about 750 ft in length. A large, fine boiler is in position. The pumps and heater are conveniently placed. The supply of water is obtained by means of a pipe running into the works. The work of taking down the machinery, removing it here and putting it in its present place, was all done under the supervision of James Knapp, who has done a fine piece of work and himself credit. A blacksmith shop is situated at the rear of the building, and an office has been built near at hand. The sinking of the new shaft, over which the works stand, has been resumed, and will be pushed downward speedily.

MAKING BORAX.—The upper or northern end of the borax marsh, lying east and south of the town of Columbus, is once more a scene of industry. After a cattle period of about fifteen years, the manufacture of borax has received renewed activity. Some three or four companies have been formed and begun operations in real earnest. Material for tanks, boilers and other machinery arrives by rail quite often, and finds its way southward by means of teams. The advance in the price of borax has done much to increase the manufacture, and the field in the southern end of Esmeralda is almost inexhaustible.

Lexington District.

REVIVING.—*Pioche Record*, July 14: Mining matters in this old district, located in the southeast corner of White Pine county, are beginning to mend. The turn of the tide appears to have struck that place. Several men have been placed at work on the gold ledge, on which a shaft fifty ft in depth has been sunk, and the ore assays from $20 to $70, there being large quantities of it, and no dead work required in extracting it. There were a couple of men from Cincinnati there the other day looking at the property, and they decided to erect a gold mill at once. The district is well supplied with water.

Safford District.

ZANOLL.—*Express*, July 14: During the past week, three men have been at work in this mine, running a drift easterly on the ore vein at the 50-ft level, a distance of over 40 ft easterly and 45 ft westerly, making the total length of drift on this level over 85 ft. A vein of rich carbonate ore was encountered the whole distance. It is contemplated to start another drift at water level, 25 or 30 ft lower. Shipment of ores in large quantities from this mine will be in order in the very near future. Work on the Onondaga has progressed favorably during the past week. The shaft is down about 50 perpendicular ft. The stratum of rich ore on the south side of gouge is continuous, and the general appearance of the shaft at bottom is indicative of increase in magnitude of ore vein and grade of ore. The shaft now produces ore assaying as high as 201 ounces to the ton in silver. This continuance of vein of high grade ore at depth is a very encouraging feature of the camp. The tunnel and crosscut are progressing rapidly and are still in ore. The river is now fordable and cars on the switch at Gerald will be receiving ore from the Onondaga to-morrow or next day. A large number of sacks are already at the river ready to be taken across and emptied into the cars. The company expect to ship several cars to Salt Lake each week.

White Pine District.

VARIOUS MINES.—*News*, July 14: Fifteen men have been put to work on the Kinsley mines. The prospects there are very encouraging. R. G. Schofield showed us this week some fine gold prospects from his mine on the upper belt, west of town. He is energetically prospecting it. The Sweetwater Company at Hamilton have suspended work on their mines on Treasure Hill, and ore hauling has been stopped. They have about 250 tons of ore at the mill. They intend to put on a force at the Reserve, which is looking well.

ARIZONA.

COPPER.—Globe *Chronicle*, July 7: Last year Arizona produced over 17,000,000 pounds of copper. Thus far during the present year the increase has been 33 %, and new furnaces are going up. It will be a safe estimate that Arizona's output will be at least 25,000,000 pounds for 1883. The Old Dominion Copper Co. have bought all the property and plant of the Long Island Co., consisting of the Cuperite, Gray, Hoosier and Nevada mines, and the 30-ton smelter. It is probable that the furnace will be moved to the site occupied by the other Old Dominion furnaces, and that all four stacks will shortly be running steadily. We understand that the Old Dominion Co. also proposes to smelt copper ores for mine owners in the district, and that probably an additional furnace will be erected for that purpose.

ITEMS.—The wages of miners have been reduced to $3 at Russellville. The Head Center mine of Tombstone has shut down. The ore being taken out of the Cave creek mines, Maricopa county, shows very rich in gold, silver and copper, and the ledges are well defined and growing larger as depth is attained.

STRIKE.—*Epitaph*, July 13: In sinking in shaft No. 7, of the Toughnut mine a few days since at a depth of 60 ft an ore body was encountered which promises to rival the famous Combination body, from which over a million dollars worth of ore was extracted. So far this new strike has proven to be 12 ft across, and averaging 120 ounces, being of similar character and grade to that from the Combination. The ore body is continually widening, with every indication of a bonanza. Professor Church considers this the best strike since the Combination ore body was discovered. Being adjacent to Vizina and Mountain Maid, a fresh impetus will doubtless be given to development in those properties. The company is erecting a new concentrating mill in Charleston, with capacity of 100 tons per day, to be used in concentrating tailings, and an experienced concentrator will arrive this week to take charge of it. Fifty tons per day are forwarded to mill and smelter, supplied mainly by West Side, although Toughnut and Good Enough are yielding considerable amounts. The quantity of ore in sight to-day in the Tombstone Co.'s properties is greater than at any time in the past 18 months, and the prospects were never brighter. For the month of June the mill turned out $61,400, and the smelter $32,000. Mill and furnace both running regularly.

ABOUT PRESCOTT.—*Courier*, July 14: The Conger mine, Cherry Creek district is looking well. The owner is having a mill erected on the Verde river, five miles above Fort Verde. Mr. Lachman, superintendent of the Hidden Treasure, Turkey Creek district, expects to start his furnace, etc., in a month or two. Messrs. Morgan, Gavin & Roberts have in the neighborhood of $50,000 worth of ore sacked. They will ship it to San Francisco. All of this wealth has come out of a small shaft, scarce 23 ft deep. Messrs. Johnston & Pentland have men at work developing mines in Turkey Creek district. The Copper Mountain furnace will start again on or about the first of next month. The Silver Belt mine is yielding an abundance of rich ore. The miners of Castle Creek district are to be congratulated. They have had faith in the richness of their lodes, which will now be made to give up their wealth, as a smelter is up and ready to turn out bullion.

PROSPECTING AND EXPLORING.—A number of prospectors came in lately from the Hunchucas and report having made a good strike, displaying a large number of specimens that contained native copper in great quantities. The boundary expedition, mention of which has been heretofore made in the *Epitaph*, left Deming on Friday last. Lieutenant Thomas Symons commands the expedition and Texas Charley (G. C. Young) accompanies as scout. The expedition will reach the San Pedro river in about 10 days. It will make a reconnoisance of the line from the Rio Grande to the Pacific.

COLORADO.

LEADVILLE.—*Tribune*, July 14: The value of the ore shipped and the bullion produced here for the past three months amounted to $1,279,815.31. The product for the first three months of this year aggregated $3,602,602, making a total for the first six months of 1883, of $7,942,477, against $7,822,390 for the same period last year or a gain of $120,087. Considering the loss of time and decreased production occasioned by the destruction by fire of the Harrison smelter and the Tabor stamp mill, the results must certainly be considered gratifying. But for these casualties, the production would show at least a quarter of a million dollars more. The amount of ore on hand at the smelters is not included in this estimate. In making the above calculation lead is figured at $90 per ton, silver at $1.10 per ounce, and gold at $20 per ounce.

RED MOUNTAIN.—*Muldoon*, July 14: Red mountain is to-day the greatest and most wonderful camp on the continent. The entire district seems one mass of mineral, and strikes continue in rapid succession. Last week the Full Moon, Guadalupe, Grand Prize, Carbonate King and Maud S. and others were added to the list of producing mines; and while they are not as yet "Yankee Girls" or "National Belles," bid fair to add thousands to the output before snow flies. There is no camp in the history of mining that has ever produced as many paying mines as has Red Mountain, and the pay in many instances dates from the first stroke of the prospector's pick. Eastern capital seeking investment in mining industries generally look with distrust upon the assertions of local papers; but those who have read the *Muldoon*, since its origin know that we are exceedingly careful regarding mining news, and always disposed to surprise rather than disappoint. But Red Mountain needs no exaggeration, as the truth itself, to say the least, wears that garb.

IDAHO.

BAY HORSE.—*Messenger*, July 12: This is a lively camp this season. The rock work of the new stack, is completed, and the company is placing the water jacket in position. The old stack is running very smoothly, yielding about two tons of excellent bullion per day. The Smelting Co. have one kiln for coal finished and are going right on with more machinery and more extended improvements in all departments. The Spring Mountain M. & S. Co., intend to start their smelter on the 20th and expect to keep it running all summer. The mines are looking splendid over there. The S. M. S. & M. Co. have been busy repairing their tramway damaged by snow slides last winter. It is now running in good order and taking ore from the Alleghania and Big Windy to the smelter. They had made a new strike a few days ago in the Big Windy that shows an 8-ft vein of thousand dollar ore which they are running to the smelter. They are building a new tramway to there mines on Mineral hill where they intend to work a large force of miners this summer. It is their intention to push their mines to their utmost and try and keep their smelter running all next winter. The camp in general is looking better than was expected. There has not been a mine in the camp this spring that has not improved in richness and size.

MONTANA.

ABOUT BUTTE.—*Inter Mountain*, July 14: The Cable mine is being thoroughly re-timbered. The main shaft of the Mountain View is 440 ft deep. The old Longmaid concentrator has been started up on Bell ore. A gold mine at Yam Hill is producing ore which assays $2,000 per ton. The projected Drum Lummon mill will be the finest structure of its size in the world. The machinery will weigh 500 tons. Mr. W. A. Clark to day contributed for exhibition at Denver a handsome piece of Original ore weighing 150 pounds. It is a characteristic sample from a mine which for the past two years has paid regular monthly dividends of $3,000. The Anaconda company will send handsome specimens of copper glance to Denver, as will also the other copper mines. The amount of silver in the copper ore at Butte gives this district the advantages over all others. Important ore developments have recently been made in the Alice mine. The 800 level has been reached and drifting west for the main ore shoot has begun from the bottom. Sinking from the Magna Charta 500 ft station has also been resumed.

ABOUT BOZEMAN.—The mineral deposits daily evidence increasing value. Two coal properities just east of Bozeman have recently changed hands. The Chesnut mine is still owned by local capitalists, but a stock company has been formed. The Northern Pacific company has contracted for theentire output of the mine for five years, and will pay the owners five dollars for each ton of coal taken out. The product of the mine will be put on sale in all the towns of Montana east and west. The Maxey mine has also been sold to an English capitalist. It is one of the finest veins of coal in the west. The location of veins of more precious minerals is of every day occurrence. In Emerson district development proceeds upon the recently discovered lodes and there is every prospect of a rich camp. From 16 Mile, 60 miles north of Bozeman, comes report of renewed vigor in working the lodes long since known and recorded. The ore carries silver, copper and a large percentage of galena. The ore is very heavy showing it to be full of mineral.

YIELDS WELL. The Algonquin mill at Philipsburg is making a trial run on a 400 ton lot of ore from the Granite Mountain mine, from which according to present battery samples, it is expected 70,000 ounces of silver will be extracted. It is second class ore, too.

NEW MEXICO.

GEORGETOWN.—*Southwest Sentinel*, July 14: The Naiad Queen, and McGregor, the McNulty, the Satisfaction and in fact all the Georgetown mines are now steadily producing ore, and it is estimated that the bullion product this month will exceed $40,000. Trust Georgetown for keeping up her reputation as the leading producer.

RICH ORE.—John A. Miller made his first shipment of ore from the Columbia mine, of the Sierra Bella group at Lake valley, last week, and his returns have already come in. The figures upon the first-class ore are 1,840.5 ounces per ton; second-class ore returns, 616.7 ounces per ton. These are the figures upon mill runs. Mr. Miller has arranged with both the Benson and Kansas City smelters for carload lots, and will continue his shipments regularly. The mine looks extremely well, the ore body in sight being computed at fully 200 tons. The bed of coal in the Florida mountains is a genuine find, and will help to make cheap fuel in southern New Mexico.

OREGON.

TLEE-AL-UM MINES.—Yakima *Record*, July 6. This camp by the usual road is about 100 miles from Yakima city, principally north, and about 12 miles west. The first claims met with on ascending the mountain, is the Tlee-al-um. A little further up is the Foster, and still higher the Ilas, at an altitude of about 700 ft. The Tacoma Mining Company's interests are here. They own the Hawkins mine on the Tlee-al-um ledge and the Wilson on the Foster ledge. The ore is free milling, and bears silver and gold and assays $2 50 to $4 surface ore. This company has two men at work there and will soon increase the force. Mr. E. P. Boyles, Esq., of Yakima has large interests here and has a shaft 60 ft down with a favorable prospect. North from these ledges about two miles, and on Hawkins gulch, are the Silver King quartz ledge, the Madeline and Red Jacket. About half way up from the Burn to the Tlee-al-um ledge is the Ida Elmore. These also prospect well. There are 15 claims located in this district. During this season work will be prosecuted on most of them and it is thought the near future will see the Tlee-al-um an important camp.

SOUTH WESTERN OREGON.—*Times*, July 13: W. T. Clemons, who has been looking after the English company's mines at Galice creek, has removed from that section and will remain in town a while. He informs us that considerable prospecting is being done on Silver and Briggs creek, as also in quartz on Galice creek. The English Co. will probably operate their mines at Galice creek next season. Walter Simmons is building a big reservoir at that place and making other preparations for extensive operations next season. Wimer & Sons are cleaning up and a big yield may be expected from their mine. R. Cook has finished 300 ft of his tunnel at Steamboat and is going still further in. He expects to strike the lost bonanza in the near future. Doseles & Co, of Scotch gulch Josephine county, have finished cleaning up and no doubt did well. Sargent Bros., in vicinity of Steamboat, are doing well. Have found some fair size nuggets. I. Epperson & Co. of Steamboat are taking out considerable gold from their placer diggings. P. Fehely, and others, who have been prospecting in Josephine county have struck it rich at the head of Johnson creek. Wm. Griffin of Slate creek precinct, Josephine county, who is prospecting a quartz ledge in the vicinity of Rogue river, brought some fine specimens of ore to town last week. Jack Layton is now engaged in cleaning up at Applegate and will be occupied for several weeks to come. Notwithstanding the fact that water has been scarcer than usual, a large area of rich ground was piped off.

UTAH.

BUYING ORES.—Salt Lake *Tribune*, July 16: A. W. Foster while in Lake City, Col., buying ores for the Sandy Smelter, Utah, 12 miles south of Salt Lake City, offered $1.06 per ounce for silver, and 4½ cents per pound for lead; less $8 for treatment. Railroad freight is $8.

ITEMS.—The road up the canyon is being repaired by a big force. Two hundred men are engaged in mining in the district. The Maxfield mine is making regular daily shipments of rich ore. The nights are cold enough in the canyon to make fires comfortable. A large number of prospectors are looking over the hills this season. All the saw mills in the canyon are running, the demand for lumber is so great. The mining outlook has not been so promising in 10 years as it is at present. Salt Lake men have just located four claims and bonded four more in the vicinity of Argenta. The Silver mountain is building a road preparatory to shipment of ore. The strike is a huge one. The upper works of the Reed & Benson have been leased, and shipments will soon be made from that property. The snow in the gulches is much deeper than at this time last year, and in some places is from five to six ft in depth. The Irma, owned by Salt Lake parties, has a foot of 65 ounce ore resembling the Flagstaff. This mine should soon be able to ship.

BINGHAM CANYON.—The Frisco mine, Bingham, continues to take out a large quantity of ore daily. The company has 3,000 ft of tunnels, shafts, and raises, and ore every inch of the way in all of them. Their vein will average 30 inches all through the mine. Their lower tunnel, to tap the vein at a depth of 200 ft deeper than the present vein workings, is in 240 ft, and according to the survey they have only 30 ft more to run to strike the vein. Allan Donaldson, the superintendent of this mine, is doing good and faithful work. Reports from other mines in Bingham are all favorable.

THE RIGHT MAN.—Utah will be well represented in the Denver Mining Exposition, which opens on Tuesday next. Prof. Clayton will be there to spread our productions before the eager gaze of thousands. No more suitable man could have been chosen for this service. Talented, learned, and upright, Clayton will in the discharge of his duties reflect credit on the Territory. In honoring such a man Utah honors herself!

Colliery Accident Relief Funds.

That colliery accidents cannot be entirely prevented is acknowledged by all who are practically acquainted with the business of coal mining; so that to provide for the survivors, when these calamities do occur, would appear to be not only praiseworthy, but an imperative duty of colliers and colliery owners alike, for it is an indisputable fact that, although the public come forward and subscribe liberally upon the occurrence of these unusually fearful accidents, which result in the sacrifice of many lives, by far greater misery is caused by the more frequent fatalities which deprive but one or two families of their bread winners. It is to meet these cases that the fatal accident relief societies have been proposed in various districts, for, as it is truly said, these associations will provide not only for the few fatal accidents which awaken public sympathy, but also for those minor cases which at present escape attention. The object of the Midland District Miners' Fatal Accident Relief Society is to provide for the widows and children of married members, and for the payment of legacies to the relatives of unmarried members who may be killed by those casualties which are of such frequent occurrence in and about coal or other mines or quarries, and a sum to defray the funeral expenses of members accidentally killed in and about the pits. This society, which it is explained is essentially a workman's society, will relieve all the local clubs of the death-rate and consequent liabilities, and will not interfere in any way with the present working of them. The committee earnestly recommend each and every member to look anxiously after the interests and welfare of the fund, and, individually and collectively, endeavor to further and advance and assist each other in carrying out the aim and objects of the society and the principles laid down in the code of rules, bearing in mind that men who are dependent upon their own hand-labor for the maintenance of themselves and families, are in duty bound to lay by something to provide for their wives and children.

To entitle a society of this kind to support from the general public it must be shown to be essentially a benevolent society and altogether unconnected with trade questions, such as from time to time arise between masters and workmen. In this respect the Midland District Miners' Fatal Accident Relief Society affords by its rules all the guarantee that need be desired. Its operations extend and are confined to the districts of Derbyshire, Nottinghamshire, Leicestershire and Warwickshire, and it is provided that all moneys received on account of contributions, subscriptions, donations or otherwise shall be applied towards carrying out the objects of the society, which, it is explained, are to provide a sum payable on accidental death and for the relief or maintenance of the widows and children of ordinary members who may be accidentally killed in or about coal or other mines or quarries. With regard to the benefits offered to the miners connected with the society, the rules provide that when any full member or half member meets with an accident causing loss of life, the funeral allowance shall be £5; there shall be allowed in addition for an unmarried full member, £10; and for an unmarried half member, £5; and to the widow of a married member, the sum of £2 10s in addition to the funeral allowance of £5, and the sum of 5s per week; the allowance to continue so long as the recipient conducts herself with propriety, to the satisfaction of the society. Any widow re-marrying shall be paid the sum of £10, in lieu of the weekly allowance; but such re-marriage shall not affect the allowance to the children. Notwithstanding the foregoing scale of allowances, the board shall have power, under special circumstances, and at their absolute discretion, on the application of the person interested, to commute the above allowances for such fixed sum as they may think reasonable. Each child of any married member, whose life may be lost through accident, shall receive an allowance from the funds of the society of 2s 6d per week. The payments to children to continue until the sons attain the age of twelve years and the daughters the age of thirteen years.

It must be obvious that such handsome benefits could not be offered in return for the comparatively small contribution of the working miners; but the stability of the society is insured by the strength which it derives from its honorary members, who are interested in the miner's welfare. The rules provide that all persons shall be eligible for admission as ordinary members, who are employed in the district in or about coal or other mines or quarries; and on payment of the contributions, hereinafter set forth, they shall be ordinary members, and entitled to the benefits of the society. All persons not being owners or lessors of mines and quarries, who assist in supporting the society with an annual subscription of not less than one guinea, or a life donation of not less than ten guineas, and all owners, lessees, occupiers, or workers of mines and quarries, who subscribe not less than twelve and one-half per cent on the amount paid by the ordinary members in their employment, and all lessors of mines and quarries who shall subscribe annually not less than ten guineas, shall become honorary members. Honorary members have the right to take part in the proceedings at any meeting of the local agency with which they are connected, and are eligible to hold any office in the society; but they have no claim to any benefit or emolument from the funds of the society. And there is a great inducement to acquire honorary membership from the advantages secured for one's workpeople, since if a member meets with a fatal accident, while working at a colliery, or mine, or quarry, where the owner, lessee, or occupier is not an honorary member of the society, the benefits under the rules are reduced to twelve and one-half per cent or one-eighth.

The constitution of the society has much to recommend it, and the rules are framed with judgment and care, so that it may be anticipated that the society will prove permanently useful and successful, and afford all those philanthropically inclined a ready channel for contributing to the relief of the bereaved and destitute.—*London Mining Journal.*

Return Air in Mines.

The London *Mining Journal* says: The Royal Commission on Accidents in Mines appears to have overlooked one most important item in the investigations in which they have been engaged during the last four years, and which has not yet terminated. In the preliminary reports they have given not a word has appeared with respect to the air in its chemical aspect as it is found when it has performed its duty in neutralizing the effects of gases and ascends to the surface. Our attention has been drawn to this by the action of the Prussian Fire-Damp Commission which is now actively at work, and issues notes of what is being done, showing that the investigations will be of the most thorough and practical character. One branch of inquiry in which great interest is taken is the chemical examination of the air from the upcast shafts of a number of German mines. The nature of the air, of course, would depend a good deal upon the gases that are given off, and in some mines there would be scarcely any, and in others a considerable quantity. As a rule, however, the German mines do not give off anything like the quantity of gas that a great many in this country do, for, at not a few of these, even in the early morning, it is not an unfrequent thing for the men to waft the gas away with their caps and jackets before commencing work. It may, therefore, be fairly assumed that were the return air in some of our mines examined it would be found to contain a much larger proportion of fire-damp than any of the mines in Germany. Yet we are told that Dr. Schondorf, of the Bochum laboratory, found the air coming from the upcast shaft of a mine in Westphalia contained 1.05 per cent of fire-damp, although the ventilation going on was at the rate of 30,000 cubic feet of air per minute.

At another well-known mine in Germany the air was impregnated with no less than 1.5 per cent of fire-damp, where over 500,000 cubic feet of air was sent through the workings every minute. Even these returns show how a mine might gather such an amount of gas, owing to an interruption of the ventilating current, that would lead to an explosion in a very short time. This will be evident when we repeat that a mixture becomes in the highest degree explosive, when the fire-damp is one-ninth or one-eighth of the total volume. Therefore, by chemically examining the return air, the state of the mine, so far as gas is concerned, is easily ascertained. If there is a high percentage of gas, it shows that the ventilation is not sufficient, and that the mine is by no means a safe or healthy one, and that an immediate remedy should be applied in the shape of an increased quantity of fresh air being sent from the surface, or by splitting the current. A record of the state of the air as it comes from the workings up the up-cast shaft of the principal mines in the districts in England and Wales that are termed "fiery," is highly desirable for many purposes, and could not fail to result in improved systems of ventilation, and in increased comfort and safety to the workmen. The Royal Commission has not yet sent in its final report, and, before doing so, it is to be hoped that it will follow the example of the Prussian Fire-damp Commission by investigating the chemical properties of the air from the up-cast shaft of certain mines in districts where they are known to give off considerable quantities of carburetted hydrogen gas. We have no doubt the Home Secretary would look upon such an addition as a most valuable portion of the report, as we feel sure all our mining engineers would do also.

NEW MONTANA DISTRICT.—A promising mining district is being opened in Montana, about 25 miles west of Bozeman, and across the Jefferson river. The discovery cannot properly be called a recent one, as a claim was staked off there 13 years ago. But this spring several miners went to prospecting the district, and the result is some 30 locations have been made. Specimens are on exhibition, and the indications favor a good mining camp. The ore carries gold, silver and copper, the latter predominating. Assays of the latter metal have given from 18 to 70 per cent, and as high as 240 ounces of silver have been received. The veins are about eight feet wide, and have one well-defined wall, the other being somewhat broken and irregular. As there is not a 20-foot shaft in the district, but little can be said, but there is every assurance that some big mines are going to be opened up.

PROSPEROUS MINERS.—It is estimated that the miners and mechanics of Butte, Montana, have on deposit at the three banks of that city about $900,000.

The Gold Fields of Venezuela.

The encouraging mining operations now being carried on with British capital in Venezuela, and especially in the province of Guayana, have several times been referred to in the *Mining Journal*, and it must be particularly gratifying to those whose funds are embarked, to find that local opinion is quite in accord with that expressed in this country. It appears that Venezuela is each year acquiring a more prominent position, and that the growing prosperity will be equally shared by Venezuelan and British capitalists. The returns published in the Trinidad *Royal Gazette*, showing the values, duties paid, etc., of the imports and exports during the past year, are highly instructive to those who have at heart the interest of this thriving colony. It will be noticed, says the *New Era*, of Trinidad, how largely Venezuela figures in these statistics, both in the imports of her gold and the various manufactured goods and other supplies forwarded there by our merchants. Little public notice has heretofore been taken of Guayana and its auriferous region, the product of the latter being now the foundation of all the business in the neighborhood of the Orinoco, and, in fact, of the State. It is an undisputed fact that these mines are the richest in the world. Who has ever heard of a district with the limited population which Caratal has at present, producing upwards of £600,000 worth of gold per annum? This amount is gradually increasing, and no doubt the ideas of our great explorer (Raleigh) have been realized—that the gold fields of Guayana is the veritable El Dorado. This island is the key to the Orinoco; it is the base of supplies.

What a great interest we should take, therefore, in watching and assisting in developing that wonderful land. Some will say we know what these mines are; we went into some foolish speculation and lost our money; but the occurrence of one mine turning out unprofitable is not sufficient evidence to condemn generally a country which has such a great future before it. Referring to the older-discovered mining districts, where are situated the fabulous El Callao Mine, the Chile or Tigre, have not these proved that there is quartz more highly auriferous than any known gold diggings in the world. Then in the later opened region, south-east of Callao, there is the Mexico, San Pasquale, La Cruz, and the Victoria; all of these are producing, it is said, gold quartz which bids fair to equal, if not eclipse, the older mines, and gold mining is as legitimate as any other enterprise when managed in a business-like way. Gold mining has been the foundation of the success of all our eastern colonies, notably in Australia and New Zealand. Why, therefore, when we have a country so near us which, though comparatively undeveloped, is rich, we say, should not more public interest be taken in proving that Guayana is a place well worthy of attention as a field for mining enterprise? By so doing, says the *New Era*, in conclusion, we think the golden sands of Yuruari will be gradually washed more and more this way, and ultimately make the Port of Spain the Melbourne or San Francisco of the Antilles.—*London Mining Journal.*

Mountains of Mica.

A New Mexican exchange says: Much has been said and written about the mica found in the mountains west of Las Vegas, and many may imagine, because there has not been already a large, profitable output, that the expectations at first announced have been met. Such is not the case. On the other hand, mineral of excellent quality, and in paying quantities, has been found in place in more than one locality. Unfortunately for us, however, the parties who have undertaken the mining of mica in San Mignel county upon a large scale, with ample means to prosecute development work, do not possess the best property, or rather that upon which the best showing can be made in the shortest time. Others who have really very promising claims, however, have not the means to work them, but are holding them at higher figures than can be obtained every day in the year. Few people understand the value, method of working, and characteristics of mica mining, but those few experts who have examined the prospects in this county have reported favorably upon them, and it is only to be regretted that more active operations have not already been begun. Upon the other slope of the range prospects lying in the same belt and formation have been sold to Ohio capitalists, who formed a company called the Mansfield Mica Co., and several large contracts with Eastern stove manufactories have already been entered into. The mine is located in the northeastern portion of Santa Fe county. The product will be shipped via Espanola to Mansfield, and there resorted and boxed for shipment to the factories.

A. N. E. Peterson and others, of the hot springs, have, within the past few days, made locations of mica mines near the source of the Gallinas, and it is their intention to work them promptly. There is certainly a large industry open for capitalists in this subject.

THE VALUE of the raw materials of hardware is as nothing compared with that of the finished fabrics. A chain was manufactured which weighed only two ounces and cost $170, being 963,600 times the value of the original iron from which it was made.

Quartz Mining in Amador.

A correspondent of the Amador *Dispatch* says: As quartz mining is one of the principal interests in Amador county, and in which I have been engaged for the past thirty years, I send you a few notes for publication in your valuable paper on that subject: The first location for quartz mining in Amador, was made at Amador City, in March, 1851, by Glover, Fitzwaters, Rogers and Dover, who located the old Amador and Spring Hill claims, and many other claims were located on the extensions. The Alpine, at Plymouth, by John Southerland, the Empire, and other claims were located in 1851. The quartz veins in the northern part of the county, have been prospected and worked for the last thirty years, and large sums of money expended in prospecting to secure paying claims, but the most of the locations have been abandoned as worthless. The value of many claims have been misrepresented, which is working a great injury to claims that are really valuable. Many locations are only made for speculating purposes, and are "wild-cat" claims, represented as valuable to victimize innocent purchasers. What is known as the "mother lode or lead," extending from the Mokelumne river to the Cosumnes river, including the locations at Jackson, Sutter creek and Amador, Drytown district and Plymouth are all on the west lead blue ribbon rock, and there is no other in this State. No other quartz belt that has as yet been found, has rock like this blue ribbon rock, or has ever been made to pay by mill process. East of the Empire or blue lead, in the Plymouth mining district from Dry creek to the Cosumnes river, there has been ten quartz mills built on east leads of the blue lead, and every one has proved a failure and been abandoned as worthless. East and west of the mother lode, as far as I know, the quartz leads have a pocket formation, and have never paid for working by mill process, and, in my opinion, cannot be made to pay, but must eventually be abandoned as worthless. For more than thirty years I have been interested in quartz mines, and my personal interest would deter me from doing anything to retard or injure the development of the mining interest; but I think the location and efforts to sell worthless mining claims to capitalists is a detriment to the mining interest and prevents capitalists from purchasing claims that are valuable. The most successful mining capitalist in this county is Alvinza Hayward, commencing at Sutter creek, on the mother lode, and he still sticks to the mother lode or blue ribbon rock lead in his Plymouth mines, and has followed it up to the Cimrch Union in El Dorado county.

It is not the wish of the writer to discourage prospecting for quartz mines, but on the contrary I have always given all the information and encouragement in prospecting that I could. But capitalists have been fooled so often in this county that they are now afraid to invest in mines that are known to be valuable and paying claims.

A SLICKENS RANCH.—The Nevada City *Transcript* has this to say about a slickens ranch near that city: About eight acres of the ranch is where there was but a few years ago a ravine that served as an outlet to various mines. Mr. Getchell built a brush dam across it, raising the structure as the tailings from the mines piled up above it, until now the surface is forty feet above the original bed of the stream. From this made ground the owner annually cuts an average per acre of from six to seven tons of timothy and clover. No other land in this part of the State produces such wonderful crops as does that slickens deposit. It needs comparatively little fertilizing, and does not "wear out" like ordinary soil.

LIQUEFIED CARBONIC ACID.—The use of liquefied carbonic acid in the preparation of carbonated beverages is recommended by Mr. Apotheker Volk, of Ratzeburg, who states that experiments have proved it to be the purest, most suitable, and best method of impregnating mineral waters. It is also claimed that by using the carbonic acid in this form the more expensive part of the apparatus now used in the manufacture could be dispensed with. The great disadvantage however, lies in the fact that liquefied carbonic acid requires a pressure of thirty-six atmospheres to hold it in that condition at zero of centigrade, which pressure rapidly increases as the temperature rises.

THE USE OF OILSTONES.—The proportions of glycerine and alcohol to be used on oilstones vary according to the instruments operated upon. An article with a large surface—a razor for instance—sharpens best with a limpid liquid, as three parts of glycerine to one of alcohol. For a graving or any similar tool, the cutting surface of which is very small, as is also the pressure exercised on the stone if sharpening, it is necessary to employ glycerine almost pure, with but two or three drops of alcohol.

GAS FLAME LIGHT.—The amount of light given out by a gas flame depends upon the temperature to which the particles of solid carbon in the flame are raised, and Dr Tyndall has shown that of the radiant energy set up in such a flame, only the 1-25th part is luminous: the hot products of combustion carry off at least four times as much energy as is radiated, so that not more than one hundredth part of the heat evolved in combustion is converted into light.

Gold Quartz Mining.

Mr. Thomas Cornish, M. E., the well known writer on mining, says:

In Sandhurst (Victoria), the noted quartz mining region of the colony, there have been many instances of marked success in gold mining, not only to many joint-stock companies, but several private mine owners, who have been exceptionally fortunate in striking rich reefs in their claims, have become millionaires, and are still in receipt of enormous incomes.

The system inaugurated for developing the resources of the district was in the early days such as tended to retard rapid development, and caused much waste of time, capital and labor. The claims were too small, and consequently caused the sinking of more shafts than was necessary for efficient working. In many places I have seen ten or twelve shafts sinking on or for a lode where there only ought to have been one—a good main shaft, a suitable size for going down to a great depth. Many companies were in existence for years sinking a shaft to a depth of 300 to 400 feet, dawdling over the work by only employing a few men, where with energy and at less cost the same work might have been done in a year.

When progressive or prospecting labor is determined on, it should be pushed on with all expedition possible, as the quicker the results are proved, the better and cheaper will it be for those who have to pay for it. Thus in shaft sinking as many men should be kept below as can conveniently work. There is no more surface labor required for four, five or six miners working in a shaft than there is for two, while more than double or treble the work gets done during the same time.

In quartz mining, it is generally necessary that the main shaft should be kept continually sinking, while levels should be opened for development at intervals of from sixty to one hundred feet, as experience may guide the manager. The neglect of keeping progressive work well ahead is oftentimes attended with much loss, not only in time wasted, but in depreciation of the value of the mine.

One of the greatest wonders in connection with gold mining industry, when any new discoveries have been made, and a rush sets in for investment, is the surprising rapidity with which mushroom authorities spring into existence. Men who by a fluke have made a lucky speculation in shares, or obtained a concession or claim in or near a locality where gold might have been seen or expected to be found, arrogate to themselves the position of oracles or authorities on the subject of gold mining, and impudently assume a knowledge of an industry that can only be acquired by long practical experience and intelligent application.

Men who never saw a gold mine, and know nothing of the proper method of working one, will write reports and undertake the control of works of which they are completely ignorant. The natural result follows that large sums of money become squandered in the purchase of mines at fabulous prices, and afterwards wasted in disgraceful management. At the expense of the shareholders and their unfortunate dupes, these mushroom authorities enjoy a butterfly existence during a brief period of sunshine (while the money holds out), when they suddenly collapse, and fall into the obscurity from whence it is a pity they ever emerged. The mischief created by these new-known authorities on gold mining, is, however, incalculable, as it is not merely the money they waste in gaining experience and making a muddle of everything at other people's expense, but their utter incapacity brings discredit upon the industry of gold mining generally, and retards the development of legitimate mines by experienced persons.

The reports which have appeared from some of the so-called managers of mines in India and west Africa from time to time since the rush set in for mining in those places have been enough to condemn the writers as utterly incompetent for the positions they have undertaken, and the shareholders are beginning to find out to their cost the mistake they have made in their selection of directors and managers, whose chief qualifications have been bumptiousness and entire ignorance of the practical details of gold mining.

PROGRESSIVE INDIANS.—The Piutes at the Pyramid Lake reservation, Nev., are showing considerable progress. They have dug five miles of ditch for irrigating purposes this year, and will raise 1,000 bushels of wheat this summer. A number of children are attending the boarding-school, begun last fall by direction of the Government, and many of them can read, write and do some work in primary arithmetic. They are also taught to cook, sew, etc., and have made considerable progress in this direction. Mrs. McMasters has charge of the school, and Mrs. Mapes is matron. Religious service is conducted on Sunday by Mr. Aibby, the Baptist minister of Wadsworth. The services are well attended, and the Indians are generally respectful and attentive.

A METAL EXCHANGE has been established in New York. Forty-four applications for seats were received in one day. The initiation fee is $350. Regular daily calls are made, and contracts for pig iron will, it is believed, be fixed at the minimum of one hundred tons, with margins at $2 per ton. Storage arrangements, which will reduce the cost of carrying pig iron, are being made.

USEFUL INFORMATION.

Musty Smells in Untenanted Houses.

It is a cause of much wonder among those who do not study the subject, why a comparatively new house, after being in use a short time and then left vacant a few weeks, should be so impregnated with bad smells and foul atmosphere as not to be endurable for habitation until the house has been thoroughly ventilated.

A little study will lead one to soon arrive at the reason for such musty odors. The parties last inhabiting the house may have left it in perfect order according to their ideas of cleanliness; as far as outward appearance was concerned, nothing could be detected to lead anyone to suppose that the musty smell generated would soon be in running order.

We can best illustrate the *modus operandi* of these generators by the following description, as furnished us by the owner of the premises: "The house had only been built a little more than a year. At the expiration of that time it was to undergo a thorough change. A servant was left to sweep out and clean up generally. After a thorough (?) sweeping, the windows were washed and the almost muddy water dumped into the kitchen sink, instead of being thrown into the yard hopper. The shelves in the pantry were washed, and the water also emptied in the sink. Instead of letting a bountiful supply of water run, that the trap might be thoroughly cleansed of filth, the girl simply used the cloth in brushing the water down the sink and forcing the thicker portions through the strainer.

The same thing was done up-stairs; windows and shelves washed, and the dirty water dumped into the wash basin, a cloth used to wipe the basin clean, and all was right. We prefer not to put in print what took place in the bath-room. To all appearance the house looked clean. The servant went through the house, shut and locked every window, and left the death-dealing musty smell generators at work. My advice to leave the windows open was not regarded, and as the time would not be up for several days for me to take possession of the premises to make the necessary alterations, I had no authority to leave the windows open.

Of course the gas fiend was soon at work. The filth left in the traps, the dirt on the shelves, wet and but half washed, etc., soon began to putrefy; the absence completely of fresh air from the windows being closed, helped on the decaying mass, and a lively ferment took place. With such generators of musty and foul vapors, is it any wonder that in a short time the house was filled with a noxious atmosphere?" We are sure, when we visited that house some days afterwards, even after sending a boy the day beforehand to open the windows all through the house, that we were met with, on opening the door, a smell that put us in mind of a certain story where a river had to be turned from its course in order to purify certain stables.

Landlords would be well paid after a tenant has left a house to immediately give it a thorough sweeping; allow the water to run several minutes in all the sinks, basins, and waterclosets; if there be a cellar, see that not a particle of vegetable matter is left around; leave a window in every room open; scatter a little chloride of lime in the cellar, and place some in a saucer in the bath-room and kitchen. It will take you but a few hours to follow these suggestions, and only a few dimes' worth of materials to carry them out. Your house, even if idle for quite a time, will be sweet and wholesome, and the little labor you have spent will be well rewarded by the praises of your new tenants upon the nice clean house they have secured.

RE-PAINTING AN OLD WAGON.—Some one recently asked the *Blacksmith and Wheelwright* if it was possible to make a good job of painting an old cracked or sealed wagon without scraping or burning all the old paint off. That journal replies as follows: "When a body is slightly cracked, it may be pasted over with putty made of dry white lead, japan and rubbing varnish, put on with a wide putty knife. After it gets perfectly dry, grind down with hard pumice stone and water. For burning off a body I use the alcohol burner. It costs about $4.00, but is the best burner I ever saw. For cleaning off the grease, I use an old half-round file, ground up to an edge. Scrape all off clean, sand paper, and paint up as a new job. In painting over old paint that has commenced to scale off, it will continue to do so and throw off the new."

NO ADVANTAGE.—The usual ways of adding to the transmitting power of belts are by applying to them oil, rosin, or some adhesive substance, and by tightening them on the pulleys. The use of oil, rosin, etc., results in a direct waste of power, for, as it gets old, it becomes gummy, and the belt sticks to the pulley, requiring a more considerable power than is generally supposed to separate it, and effectually neutralizes all the advantage sought to be gained by its use.

AN OIL for belting is recommended which consists of nine parts of linseed oil and four parts of litharge, ground in water. These, boiled to a plastic consistency, then liquefied by an addition of turpentine, furnish an oil which, it is claimed, promises many admirable qualities.

UTILIZING BURNING CULM-PILES.—An interesting application of a patent analogous to those for utilizing the waste products of coke, recently taken out by Mr. H. L. Armour, and the property of the Jameson Coke Company (limited), has just been made in the case of a pit-heap at Seaton Burn Colliery, in Northumberland. A pit heap is a deposit for quantities of small coal and dust, for which, as a rule, no market can be found, as well as for shale and iron pyrites met with in working the coal. These heaps are generally burning, and in very many instances, give off so much smoke and dirt as to become a terrible nuisance to the neighborhood. This was the case at Seaton Burn; but by simply covering the heap with sand, and sinking a number of iron pipes connected with a main, in which a constant suction is maintained, all offense has been removed, and a stream of gas, yielding both oil and ammonia, is obtained. In this manner a worse than valueless property has been converted into a profitable one, and, as the system is now in course of extension to large heaps at Kelvinside, near Glasgow, it is to be hoped that before long an end will be put to one of the greatest nuisances in colliery districts.

BENDING PLOW HANDLES. No special machinery is required for bending plow handles, further than a wooden form to bend over, and an eye to hold the end, with a hook to catch the long end and hold it, all of which may be home-made. The timber does not require to be seasoned. The handles, if green, require steaming long enough to heat them through, possibly one hour. If they are dry, they should be soaked in warm water at least one day before steaming; then two or three hours' steaming should be enough. Much depends upon what kind of timber the handles are made of. Those who make a business of bending and making plow handles make them double to prevent splitting the ends by bending close to the end, and afterward cut them. Often a piece of band iron is placed on the convex side of the wood, and bent with it to prevent splintering.—*Wood Worker.*

FIXING LOCKS.—When it is not convenient to take locks apart in the event of keys being lost, stolen or missing, and it is desired to fit a new key, take a lighted match or candle and smoke the new key in the flame, introduce it carefully into the keyhole, press it firmly against the opposing wards of the lock, withdraw it, and the indentations in the smoked part of the key will show exactly where to file.

THE RUBBER PLANT IN MEXICO.—Mexico is making a study of the culture of the rubber plant. The hardiness of the plant is said to be such that its culture is exceedingly simple and inexpensive, where the climate and soil are suitable. In much of the Mexican coast region the only expense is the weeding required, when the plants are young, to give them a chance to grow and strengthen.

GOOD HEALTH.

Dyspepsia—Variety in Human Stomachs.

Dyspepsia, which is so much complained of and seems to be so widespread, arises from various causes, and is cured in various ways. Many people imagine that the internal organs in all individuals are the same, and that like treatment will produce like results in everybody. The internal organs are alike in different people just as their faces, hands, feet, figures, are alike. A celebrated surgeon who has attended a thousand autopsies, says that the aspects of the inside of bodies vary as noticeably as the aspects of the outside of the same bodies, and we know that the variations in these are infinite. It is very rare that we find the hands of any two persons agree exactly in form, proportion, color, symmetry, even though the same number of glove may be worn by both. The same thing is true of the other external members of the body, and equally so of the internal organs—the heart, the lungs, the liver, the stomach, and all the rest. Just as a man must have his clothes made to order if they are to be a perfect fit, just as he must have his own last for his shoes, and his own measure for his gloves, so he must fit his stomach with food "convenient" for it.

"I've tried to eat oatmeal and vegetables and graham bread, and do without meat and fine flour," said an author to an expounder of hygienic living on the vegetarian plan, "but I can't write on such food. I must have a generous diet or my brain won't work." The professor was a man of sense, and looking over the complainant carefully, replied: "Your stomach is small and you need concentrated foods; meat, eggs, and fine flour with fruits are your proper diet." A person with a large stomach and a vigorous circulatory system can absorb large quantities of plain cold food and find nutriment and comfort in it. To such a person, condiments are superfluities, but with a person of limited capacity of eating and feeble circulation, warm food and vegetables are not only grateful but necessary. Even sheep like spicy bushes, and when they are permitted to run wild in the woods, regale themselves on aromatic herbs and shrubs, and by this food their flesh acquires a gamy flavor.

The kind of work a person does largely determines the quality and quantity of food he requires. Corn bread, cabbage, pork, onions, potatoes, apples, supply the necessary elements wanted by the average workingman in the open air; but the man who uses his brains as well as his hands, and works indoors, will not thrive on this diet, and he who uses his brains and not his muscles, will not find it at all suited to his needs. What he will find suited to his needs he can determine only by experiment, and this is true, more or less, of every individual. To one, oysters are an active poison; to another, strawberries; to another, onions; to another, cheese; and yet these foods are good for the majority of eaters. Some can make a satisfactory meal of one dish; others require a variety of dishes to keep their stomachs complaisant. The same person under one set of circumstances will relish and digest foods that under others would be abhorrent and sickening to him. One who has been surfeited with rich and varied bills of fare, will settle down to the mush and brown bread of some "Cure," and thrive on the diet. He has been overfed, and now it benefits him to be underfed. Another, who has had his fill of lean fare at home, will loath the mush and brown bread, and suffer indigestion from eating it. One who has enjoyed a choice of dainties may possibly find "hog and hominy" tolerable when "roughing it," but a steady adherence to this dish will cause dyspepsia in the toughest stomach.—*N. Y. Tribune.*

The moral of the above is, that as stomachs are as unlike each other as faces or dispositions; so each must acquire that wisdom which will enable him to be perfect master of himself and govern his taste and appetite according to his own peculiarities of constitution and needs.

Baldness.

In an article recently contributed to the *Gesundheit*, a paper, as its name imports, devoted to sanitary subjects, Professor Reclam, a German *Gelehrter*, makes some timely and useful observations on the subject of baldness. After describing, in a vein of pleasantry, the vast array of bare polls which may be seen any evening in the pit of a theater, or the body of a lecture room, he discusses the causes of baldness. He does not think, as is sometimes said, that loss of hair is the result either of impaired health or of much study. The strongest men are often bareheaded, and German professors, who care nothing if not studious, are distinguished above all men by the profusion of their locks. On the other hand, soldiers and postilions, who wear heavy helmets and leather caps, and wear them a good deal, are frequently as bald as billiard balls. From these facts Herr Reclam draws the conclusion that baldness comes chiefly of the artificial determination of blood to the head, and to the heat and perspiration thence arising. The result is a relaxed condition of the scalp and loss of hair. If the skin of the head be kept in a healthy state, contends the Professor, the hair will not fall off. To keep it healthy the head covering should be light and porous, the head kept clean by washings with water, and the hair cut short. The nostrums vended as hair restorers, and on which a fabulous amount of money is wasted by the ignorant for the benefit of quacks, he denounced as worse than useless. In ninety-nine cases out of a hundred they are worse than useless. Cleanliness and cold water are the sole trustworthy specifics; but when once the hair roots are destroyed, not all the oil of Macassar, the bear's grease of Siberia, nor the cantharides of Spain will woo back the vanished locks.

POISONOUS FLOWERS.—Every summer, when the beautiful oleander is in bloom, some cases of persons being poisoned by this flower have been recorded. Last year a young lover at Oroville was nearly fatally poisoned, by chewing the leaves of an oleander boquet, given him by his sweetheart, and a young gentleman and lady, at Marysville, came near climbing the "golden stairs," by chewing the twig of an oleander bush. This flower is usually of a rich, pale red, but is sometimes white, and is a lovely, sweet scented bloom; but the wood and all parts have a poisonous action, resembling that of digitalis, and is best treated by a judicious use of stimulants. The first instance of poisoning this year, has just reached a *Record* reporter, who was informed by a person conversant with the facts. One evening last week, a young lady named Sadie Meeker, residing with her parents, near Vina, carelessly chewed an oleander bud. In a short time afterward she was taken deathly sick, and probably would have died had not medical assistance been immediately brought from Tehama. Her mouth and face were distorted out of recognition, and the pains suffered by the girl were most intense. Happy to relate, though, she is now recovering, but her once pretty mouth now looks like a piece of raw liver.—*Chico Record.*

THE ISTHMUS OF CORINTH CANAL.—By the canal through the isthmus of Corinth, which will probably be finished in less than five years, vessels from the Adriatic ports will save 185 miles, and those from the Mediterranean 95 miles. There is also an advantage in avoiding the dangerous coasts in the vicinity of Matapan. The canal will be four miles long, seventy-two feet wide, and twenty-six feet deep at low water.

"HELIUM."—Professor Palmeri announces the discovery in the lava of Vesuvius, the substance giving the spectrum line of "helium," an element hitherto recognized in the sun. Efforts will probably be made to isolate it.

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SAN FRANCISCO:
Saturday Morning, July 21, 1883.

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BUSINESS ANNOUNCEMENTS.

Machinery—Lane & Bodley Co., Cincinnati, Ohio.
Civil Engineer—Wm. Bredemeyer, Salt Lake City, Utah.

Passing Events.

Nothing momentous or especially noteworthy to be reported in the category of Passing Events this week. We are having a rather cool summer at the bay, and not over hot elsewhere on the coast. There is work for almost every class of laborers at fair wages in both city and country, the farmers in some localities complaining of a lack of harvest hands. The grain crop being gathered will about come up to the average, and the grape crop will be very abundant, which is more than can be said of most kinds of fruits and berries. The shortage in these, due to the hot, high winds of June, is being made manifest in the high prices ruling for these products, and in the somewhat restricted and much interrupted operations of the larger canneries, which find it impossible to procure enough material to keep their employes constantly busy. This works a great hardship to the many girls and poor women who, at this season of the year, rely upon these establishments for employment, and some of whom are able to put in not more than three or four days in the course of the week.

Many of the denizens of San Francisco have left the city, the most comfortable place of abode in the State or out of it, and gone off to enjoy the torments and harrassments of the springs and other summer resorts, or to swelter in the heat of the interior. They all have a royal good time, and are generally glad to get back. Meantime the inhabitants of the rural districts repair to the city to swelter in the fogs and get thoroughly cooled off in the frigid clime of San Francisco.

What the Report of the Director of the Mint Shows.

From advance sheets of the forthcoming report of H. C. Burchard, Director of the Mint, the mines in the United States appear to have produced during the year 1882 nearly two and a fourth million dollars less in gold, and over three and three-fourths millions more in silver than they did in 1881. The falling off in the product of gold was mainly due to the interference with hydraulic mining in this State by legal process, and the lessened output of the Bodie mines. The yield of gold in Idaho, however, decreased to the extent of $200,000, and of Dakota $700,000, Oregon showing also a diminished production. The opinion is expressed in this report by Mr. Burchard that the production of gold with us will follow that of other countries, and go on diminishing hereafter.

Canvassing the prospects of the future, we feel constrained to dissent from the opinion here expressed. It is true, there has been a great falling off from the quantity of gold formerly taken out in California; the declension during the last quarter of a century being even so great as Director Burchard states. But the product here has probably reached its minimum. Gold gathering during the first ten years of its existence in this State could hardly be called mining. It was little more than collecting the metal which nature had already mined for us and placed within easy reach. Being so accessible, and with so many hands in the field, the most of the crop was soon garnered. As regards the shallow placers, we are now merely gleaning the stubble, finding now and then a full sheaf hidden in some by-corner of the field, or overlooked in the rushing harvest. In the deep placers and the quartz veins lies our great and permanent wealth in this metal, and these stores we are now only just beginning to open up in anything like a systematic and efficient way. After a few years our annual production of gold will sensibly increase; then for a considerable time it will augment more rapidly, only in the remote future again undergoing a marked decline. As in California, so in most of our other mining States and Territories the yield of this metal will sooner or later experience some increment, to be kept up for an indefinite period, and then fall off again. Within another decade there will be some increased production of gold all round, though in all probability not so great relatively as that of silver.

The largest gain for the year in silver has occurred in New Mexico, amounting there to nearly two million dollars. The gain in Montana amounted to $1,700,000; in Idaho to $700,000, and in Utah to $400,000, while Arizona barely held its own.

The following table shows the total amount of gold and silver taken out in the several States and Territories named therein, and the production made of each of these metals:

States and Territories.	Gold.	Silver.	Total.
Alaska	$150,000	.....	$150,000
Arizona	1,065,000	$7,500,000	8,565,000
California	16,800,000	845,000	17,645,000
Colorado	3,360,000	16,500,000	19,860,000
Dakota	3,300,000	175,000	3,475,000
Georgia	250,000	.....	250,000
Idaho	1,500,000	2,000,000	3,500,000
Montana	2,550,000	4,370,000	6,920,000
Nevada	2,000,000	6,750,000	8,750,000
New Mexico	150,000	1,800,000	1,950,000
North Carolina	190,000	25,000	215,000
Oregon	830,000	35,000	865,000
South Carolina	25,000	.....	25,000
Utah	190,000	6,800,000	6,990,000
Virginia	15,000	.....	15,000
Washington Ter.	120,000	.....	120,000
Wyoming	5,000	.....	5,000
Totals	$32,500,000	$46,800,000	$79,300,000

The dividends made by incorporated companies in 1882 compared with those of 1881, show a slight falling off, being for the former year, as follows:

States and Territories.	Mines.	Amounts.
Arizona	5	$1,887,500
Colorado	16	2,326,650
California	10	1,312,047
Dakota	3	1,110,000
Montana	3	221,000
Nevada	7	683,262
Utah	4	2,129,000
Idaho	3	38,000
Georgia	1	48,000
New Mexico	2	204,000
Totals	54	$9,939,975

The above fails to show all the dividends realized during the year by incorporated companies, to say nothing of profits realized by incorporated companies and individual miners.

The number of persons engaged in mining during the year was, so far as reported, as follows:

Arizona	4,678
California	37,147
Colorado	28,970
Dakota	3,570
Idaho	4 708
Montana	4,813
Nevada	6,674
New Mexico	1,496
Oregon	3,696
South Carolina	114
Wyoming	328
Utah	2,592
Total	98,786

The number of men engaged in mining west of the one hundredth meridian is less than 100,000. The total product of bullion made averages nearly $1,000 per year for each man engaged in the business, besides large values realized from mining, coal, copper, lead, etc.

Improving on Further Acquaintance.

As some persons who disappoint us at first improve on further acquaintance, so are many of the mining districts on this coast which disappointed the pioneer prospectors, beginning to show, under more patient and skillful exploration, a much greater wealth than they were at first supposed to possess. Many localities that in the early day were passed by as unworthy of notice, and even some in which a good deal of work was done, but with results so little encouraging that they were afterwards abandoned or nearly so, have in these later times begun to attract capital and gather in population by reason of the much medium grade ore they contain and the promising indications shown. It is true, ores can now be worked with profit which were entirely worthless twenty years ago. Many and notable changes have during this period taken place in the business of mining, more especially in the departments of metallurgy and ore extraction. During these years our prospectors and miners have learned many things they required to know, and forgotten a few that they might better never have learned. They have discovered that Comstock and Eberhardt lodes are few and far between. They have learned that less than hundred dollar ore can be worked with profit, and forgotten, or at least partially forsaken their roving, unstable habits and stock gambling practices; besides some gains made in other forms of grace and other kinds of saving knowledge. Hence this rehabilitation of the once neglected and nearly deserted districts and this contentment to there abide and work for more moderate but surer returns. This ability to subsist at less cost and make living wages out of lower grade ores is equivalent to the discovery of new mineral regions and richer deposits in the olden time. So great is the extent of our known mineral domain and so abundant its resources that some improvement in the habits of our mining population and in our methods of mining is of more moment just now than the discovery of new metalliferous regions. Our prospectors have already run over too much territory making locations and doing little else. As a general thing they have too many claims with too little work done upon them. The miner who has stopped in one place and proved his lodes is apt to have something to show for his labor, whereas the persistent prospector has generally very little.

Among other of these partially resuscitated districts is the locality known as American Flat, two miles south of Virginia city, and through which it was at one time confidently believed the great Comstock lode was continued in that direction, and in the effort to discover which, millions of dollars were expended in the early day. Proving ineffectual, labor on American Flat was at last nearly suspended, very little having been done there for the past ten or twelve years. Recently some very rich ore has been struck there by parties working the mines on tribute, and the old camp, with its dilapidated mills and hoisting works, its abandoned shafts and tunnels, its empty houses and generally woe-begone appearance, exhibits signs of new life, and it would not be strange if something of its ancient importance were in course of time restored to it. From Pioche and other points in eastern Nevada, from Lida valley in the southern part of the State, and from divers camps in southeastern California, come like notes of a general revival in districts where for years past little or nothing had been done. This awakening is creditable to the good sense and pluck of our miners, and augurs well for the future of the business. We shall watch with interest and make a note of all other examples of this kind brought home to our knowledge.

The Analysis of Furnace Gases.

Read at the Boston meeting of the American Institute of Mining Engineers, February, 1883, by Magnus Troilius, chemist to the Midvale Steel Company, Philadelphia.

For some time I have been using with great advantage, for the purpose of determining rapidly and accurately the chemical composition of gases from Siemens' producers, an apparatus arranged generally like that proposed by Prof. Eggertz; * and I now take pleasure in laying before the members of the Institute a description of the apparatus and its use, hoping that some of them may find it of practical advantage.

At the end of the paper are given some results obtained and heat calculations, with the necessary data for the same.

Collection of Gases.

Fig. 1 shows the arrangement for taking a sample of gas. The funnel, F, which may be made of tin plate, is made to fit the test-hole. The gas passes up through the funnel and through the rubber tubing with the glass tube, K, filled with asbestos for retaining dust, and is drawn into the upper flask by means of water flowing from the same into the lower flask. The upper flask must be *completely* filled with water from the beginning, so that no air remains. When filled with gas the screw-compressors are securely fastened on, and the flask disconnected from the funnel and receiver. Quart flasks, with openings at the bottom, are very suitable and easily obtainable.

Composition of the Gases.

The ingredients found in producer gases are: Carbonic acid (CO_2), oxygen (O), ethylene (C_2H_4), carbonic oxide, (C. O), hydrogen (H), and marsh gas (CH_4). The nitrogen is taken by difference. CO_2 O, C_2H_4, CO are determined by absorption in various liquids and by observing the resulting diminution of volume. H and CH_4 are determined by combustion with oxygen.

Carbonic Acid.—For this gas is used a solution of 16 grams of potassium hydrate in 100 c. c. of water; 4 or 5 c. c. of this solution absorb 100 c. c. of CO_2.

Oxygen.—Twenty grams of pyrogallic acid are dissolved in 100 c. c. of air-free water. For use, this is mixed with an equal volume of the above potassium hydrate solution. Four c. c. of the mixture absorb the oxygen from 100 c. c. of air. It should be kept in a dark bottle.

Ethylene (C_2H_4).—A little bromine vapor effects the complete absorption of this gas.

Carbonic Oxide.—Dissolve 15 grams of suboxide of copper (Cu_2O) in 100 c. c. of hydrochloric acid (l. 19 sp. gr.), at 70° or 80° C. under a thin layer of paraffine. Keep metallic copper in the solution and use a dark bottle.

Hydrogen and Marsh Gas (CH_4). Fig 2 shows the combustion tube through which the mixture of these gases is passed. It is of platinum, with .5 mm. internal and 2 mm. external diameter. At the ends it is provided with cylinders of German silver for attaching rubber tubing. Mr. J. Bishop, of Sugartown, Chester county, Pa., supplies good tubes of this kind.

As seen from the sketch the tube is bent into a double coil, and in use it is held in a slanting position, the smaller coil only being heated to redness during the operation. Very rapid combustion takes place in this way. The bore of the tube should not be above .5 mm., otherwise explosions can occur.

Complete Analysis.

Fig. 3 shows the apparatus for complete gas analysis. The gas burette, B, is graduated to 100 c. c. capacity. It is connected with the funnel at the top, by means of a three-way stopcock, which can be turned so as to communicate with either the funnel or the pipette, P, of 200 c. c. capacity. Between the pipette and the burette the combustion tube is suspended. A screw compressor is applied between the combustion tube and the three-way stopcock; this compressor is used, during the combustion, as the chief regulator of speed for the gas mixture, passing from B to P and returning to B. The flasks F and F' can be raised or lowered by means of the stands S and S', with movable shelves or brackets, as shown.

At the lower end of the burette an ordinary glass stopcock is placed; a three-way stopcock would, however, also work very well here, as it is necessary, during the operation, to connect alternately with a suction pump and the flask, F. Before reading off the volume, the gas is compressed a few centimeters by raising the flask, F, and letting it bubble up through a little water in the funnel. In this way the gas is made to assume the same pressure as the air. The volume may now be taken, either by holding F so that the water therein is on the same level as the water in the burette, or simply by letting in water from a funnel as long as it will run. I prefer the former mode. The cylinder, C, is filled with water and holds a centigrade thermometer. The temperature can thus be observed and kept constant during the entire analysis. This is of importance in accurate work, as the gas expands according to the formula $v(1+.004t°)$, or about .4 c. c. for every degree centigrade.

To start an analysis, draw out a few cubic centimeters of water by means of the suction pump, taking care to have the screw compressor at the top well closed, and the funnel shut off, when the lower stop-cock is open. Let a few cubic centimeters of the potas-

* Jernkontorets Annaler, 1882.

sium hydrate solution flow into the burette from the funnel. Almost all the carbonic acid is taken up when the alkaline liquid flows down slowly along the sides of the burette. It is well, however, to take out the burette from the holder, and move it so as to let the liquid flow slowly backwards and forwards. The potassium hydrate is then carefully washed out by repeatedly drawing off the liquid from the bottom of the burette by means of the suction-pump, and letting pure water flow in from the top of burette; the remaining volume of gas is then read off. The other gases are then taken in the same way, by introducing the proper ab-

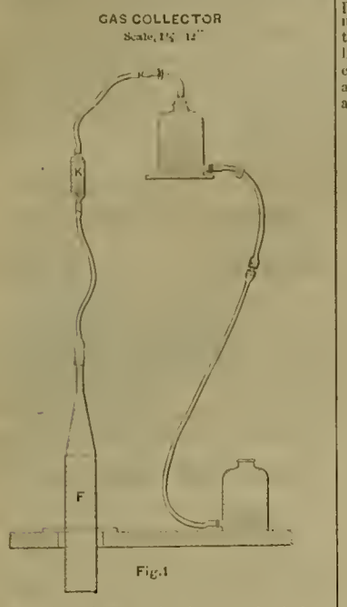


Fig.1

sorbent, observing that in the case of ethylene no shaking of the burette is required, as the bromine vapors fill the burette.

Each reagent must be carefully washed out before introducing another, and they must be used in the order described—namely, potassium hydrate for carbonic acid, pyrogallic acid for oxygen, bromine for ethylene, subchloride of copper for carbonic oxide. A little hydrochloric acid must be added to the first water used for washing out the last named reagent, as otherwise a white precipitate of basic copper chloride will come down.

Potassium hydrate would expel carbonic oxide from its solution in subchloride of copper. Both hydrochloric acid and bromine give a tension to the gas, but this is obviated by careful washing before reading off. More shaking is required to effect the absorption of the carbonic oxide than in the case of the other gases.

The absorbing influence of water does not practically interfere with the results if the gas is analyzed soon after taking the sample. If the gas be allowed to stand in contact with water for any length of time, the carbonic acid will be partly or wholly absorbed, while the

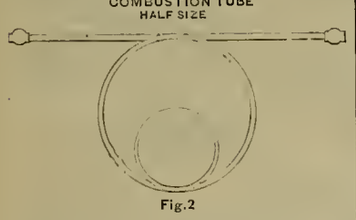


Fig.2

other gases suffer but very slight diminution in volume.

After removing the carbonic acid, oxygen, ethylene and carbonic oxide, as above described, about 20 c.c. of pure oxygen are taken into the pipette P. This is an ample quantity for determining by combustion the amounts of hydrogen and marsh gas, usually contained in about 100 c.c. of producer-gases. As a safeguard against explosions, the rule may be observed that the sum of the volumes of the gases taking part in the combustion must not exceed one-half of the total volume of the gases in the burette.

To mix the gases in the burette with oxygen, the flasks F and F' are raised and lowered alternately, and the speed of flow of gas regulated by means of the screw-compressor at the top of burette. When thus mixed, the volume of the gas mixture is read off and the combustion-tube gently heated while the gas is passed at the rate of about 10 c.c. per minute from B to P. The smaller platinum coil is then heated to full redness, and the gases are drawn back from P to B. Complete combustion of hydrogen and marsh gases then takes place in the tube; vapor of water, which condenses, and carbonic acid are formed; one volume of hydrogen giving one volume of water and one volume of marsh gas, giving one volume of carbonic acid and two volumes of water.

The actual number of cubic centimeters representing the free hydrogen in the original gas volume, is consequently obtained from the formula:

$$\frac{2}{3}\,[M - 2c.]$$

M being the total diminution of volume after combustion, and c the volume of the carbonic acid from the marsh gas. This carbonic acid is, of course, determined as previously described. It gives the volume of the marsh gas direct.

Fig. 4 shows a simpler burette without glass stopcocks, chiefly intended for the determination of carbonic acid, oxygen and carbonic oxide only. By inserting a T tube between the funnel and burette, a more extended use may be had of this very simple and convenient apparatus. In this case, however, bromine can not be used for the ethylene, as it would attack the rubber-tubing. Sulphuric acid, in a special burette, and before using the other reagents, could be used instead. Producer-gases do not, as a rule, however, contain any considerable amounts of marsh gas or oxygen, and for prac-

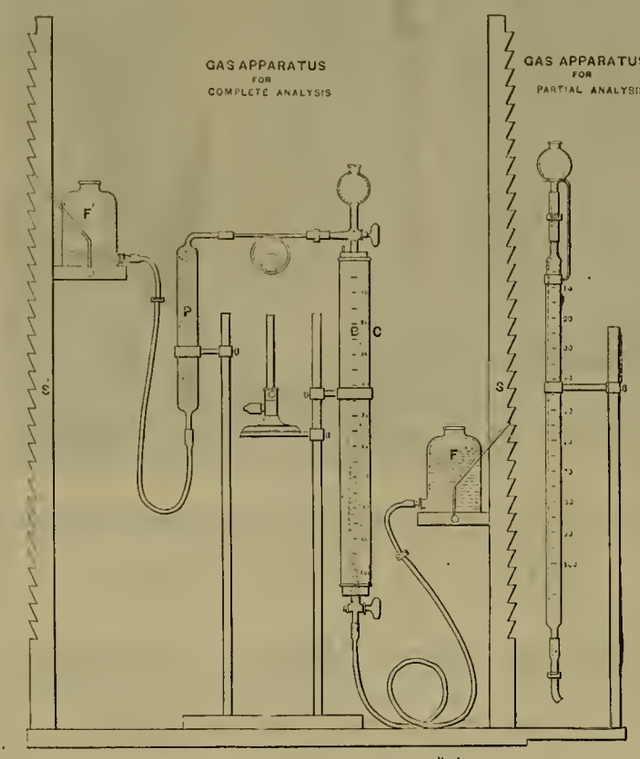


Fig.3 Scale, 6" 1' Fig.4

tical purposes these gases may be left out of the analyses altogether.

Analyses and Calculations of Heat

In a special table below are given the results of eight analyses of producer-gases by the method described. The first six samples were taken from the blast-producers of Messrs. Hoopes & Townsend, of Philadelphia. These producers were designed by their mechanical engineer, Mr. Ferdinand Philips. Sample No. 1 was taken from a producer into which the blast was forced by means of a fan. In all the other cases the blast was forced in by means of steam-injectors. Anthracite coal was used in all the producers.

The last two analyses in the table were taken from the Siemens' draft-producers for the open hearth plant at the Midvale Steel Works, using soft coal.

To find the total amount of heat-units that can be developed by the complete combustion of 100 liters of one of the gases at 0° C, and 760 mm. pressure, one has only to multiply the CO, C_2H_4, H and C_2H_4, as found from the table, by the number of heat units belonging to each of these gases per one liter at 0° C at 760 mm. pressure. These numbers are, according to Bunsen:

For hydrogen, 3088 (burned to H_2O, which condenses).
For carbonic oxide, 3007.
For marsh gas, 8482.
For ethylene, 13982.

One volume of hydrogen requires for combustion to one volume of water, one half its volume of oxygen (2½ vol. of air).

One volume of carbonic oxide requires for its combustion to one volume of carbonic acid, one half its volume of oxygen (2½ vol. of air).

One volume of marsh gas requires two volumes oxygen (10 vol. of air) for its combustion, to one volume of carbonic acid and two volumes of water.

One volume of ethylene requires for its combustion to two volumes of carbonic acid and two volumes of water, three volumes of oxygen (15 vol. of air).

These four combustions are chemically expressed thus:

Hydrogen:

2H	+	O	=	H_2O.
2 vol.		1 vol.		2 vol.

Carbonic Oxide:

CO	+	O	=	CO_2.
2 vol.		1 vol.		2 vol.

Marsh Gas:

CH_4	+	4O	=	CO_2	+	$2H_2O$.
2 vol.		4 vol.		2 vol.		4 vol.

Ethylene:

C_2H_4	+	6O	=	$2CO_2$	+	$2H_2O$.
2 vol.		6 vol.		4 vol.		4 vol.

The latent heat of vapor of water per liter is (Buusen) 514 heat units. The specific heat, per liter, at 0° and 760 mm. pressure of nitrogen, carbonic acid, and vapor of water are (Bunsen):

For nitrogen	— .307
For carbonic acid	— .425
For vapor of water	— .382

By aid of these data the theoretical or flame temperatures of the gases are calculated. In these calculations it is supposed that the gas is completely consumed with the least possible amount of air, and that the heat is entirely taken up by the products of combustion, viz.: carbonic acid, vapor of water, and the nitrogen, which was partly present in the gas before combustion, and partly carried along with the air for combustion.

The calculation of the flame temperature is best illustrated by an example. Take, for instance, gas No. 10 (vide table). We have:

$$93966 = [(3.9 + 27.3 + 1.4) .425 + (67.4 + 54.6 + 11.2) .307] T + 514 \times 2.8 + (T - 100) 2.8 \times .382.$$

This equation may be transformed thus:

$$93966 - (476 \cdot 2.8) = [(3.9 + 27.3 + 1.4) .425 + (67.4 + 54.6 + 11.2) .307 + 2.8 \times .382] T \therefore T = 16540 \text{ C.}$$

This latter equation gives a good general rule for calculating the flame temperature of a gas as follows:

Put the number of calories per 100 liters, minus 476 times the volume of the water formed by combustion of 100 liters, equal to the temperature sought, multiplied by an expression consisting of a sum obtained by multiplying the CO_2, H_2O, and N with their respective specific heats per liter and adding the products together.

Iron and Civilization.

It is quite common among political economists, says the *Iron Age*, to measure the advancement of a nation toward the plane of a high civilization by its consumption of such products as indicate the nearest approach to the perfect development of mechanical skill, or the wide-spread existence of diversified industry. There is no doubt that the most civilized nations use the highest quarterly per capita of every useful product. Such nations not only provide themselves with food in great plenteousness and variety, but they also clothe themselves and furnish their homes with care and taste, provide the best facilities for transportation, and the machinery best calculated for perfect work, by which all their needs and luxuries are supplied. Wool and iron are perhaps the two largest and most important factors by which a nation's superiority may be thus measured, and are each referred to as furnishing tests for comparing the relative advancement in the arts and sciences and in the social condition of different peoples.

It will be interesting in this connection to notice the actual consumption of the principal factor, iron, by several of the leading nations of the earth. It will be observed that the United States heads the list, followed, at quite a distance, however, by Great Britain, France, Germany, etc:

COUNTRIES.	Tons.
United States	6,065,019
Great Britain	4,618,932
France	2,508,706
Germany	2,488,967
Russia	965,000
Austria	625,000
Belgium	587,000
Italy	280,000
Holland	257,963
Spain	205,494
Sweden	190,000
Brazil	75,756
Turkey	65,000
Portugal	58,000
Mexico	48,821

As Americans, we have no fault to find with the showing, even though a per capita calculation be entered into to reach, by the aforementioned sale, the relative degree of civilization between ourselves and our sister nations. In the *production* of the raw material, however, the showing is not so flattering; and it is all the more suggestive, from the fact that no nation on the globe excels our own in the natural facilities for producing this most essential of all the products of industry.

It appears from the statistics of the various countries that three parts of the whole quantity of pig iron are produced in England, America and Germany, the remainder being contributed by France, Belgium, Austria, Russia, Swedeu, Spain, Turkey, Italy, Australia, Japan, Switzerland, Canada, Mexico, and, in very small proportions, a few other countries. In 1882, the production of pig iron in England rose to 8,493,287 tons; in America, to 4,623,323 tons; and in Germany, including Luxemburg, to 3,170,000 tons. The production last year of these three countries was consequently 16,286,610 tons, while that of the whole world amounted to 21,000,000 tons. Great Britain has, therefore, contributed about 40 per cent of this quantity, the United States about 22 per cent, and Germany about 15 per cent; moreover, the American out-turn equaled 54 per cent of the German, and 37 per cent of the English,

ANALYSES OF FURNACE GASES.

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	No. 1a. Fan-blast—Hot-working producer	No. 1b. Steam-blast—Cold-working producer	No. 2a. Steam-blast—Just before cleaning producer; had coal	No. 2b. Steam-blast; had coal	No. 3a. Steam-blast; normal running	No. 3b. Taken 10 minutes after sample 3a, with air shut off as far as possible and only steam let on	Sample taken just after cooling fires with water from below	Sample taken just before cooling fires with water	Sample taken just after cooling down fires with water from below
Carbonic acid CO_2	3.9	8.7	9.3	7.5	8.0	6.1	5.7	1.5	5.9
Ethylene, C_2H_4							.9		
Carbonic oxide, CO	27.3	20.0	16.5	16.0	15.5	22.3	15.4	23.6	17.7
Hydrogen		8.7	8.6	15.3	14.9	28.7	8.3	6.0	9.8
Marsh gas, CH_4	1.4	1.2	2.7	1.9		1.0	3.8	3.0	2.4
Nitrogen (difference), N	67. 4	61.4	62.9	59.3	61.6	41.9	65.9	65.9	64.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Calories pr. 100 litres at 0° and 760 mm.	93066	97184	99074	111474	92620	164164	116753	114039	103843
Flame temperature	1619°	1658°	1575°	1706°	1613°	1846°	1656°	1761°	1642°

NOTES.—1a and 1b, from different producers but at the same time; 2a and 2b, do.; 3a and 3b, from the same producer. The last two analyses from Midvale belong together, being taken with half-hour interval.

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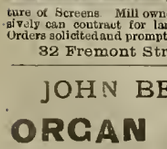
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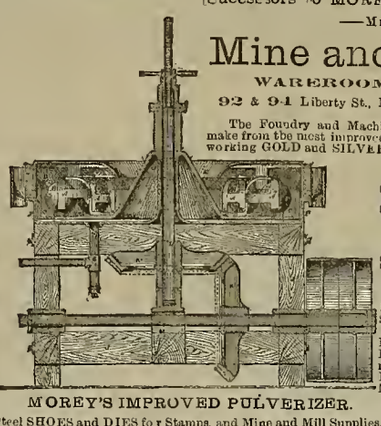
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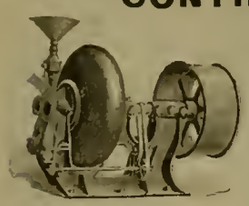
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Gold and Silver Refinery And Assay Office.

HIGHEST PRICES PAID FOR

Gold, Silver and Lead Ores and Sulphurets.

Manufacturers of Bluestone.

ALSO, LEAD PIPE, SHEET LEAD, SHOT, ETC.

This Company has the best facilities on the Coast for working

GOLD, SILVER and LEAD

IN THEIR VARIOUS FORMS.

PRENTISS SELBY, - - Superintendent

COPP'S U. S. MINERAL LANDS,

Laws, Forms, Instructions and Decisions.

Has no surplus verbiage. Contains Dr. Raymond's Glossary. Explains how to examine mining titles. Contains numerous court decisions. Gives the Public Land Commissions Codification, and gives many and d improved forms. Price—Full law binding, extra paper, $6.00.

For Sale by DEWEY & CO., San Francisco.

San Francisco Cordage Factory.

Established 1856.

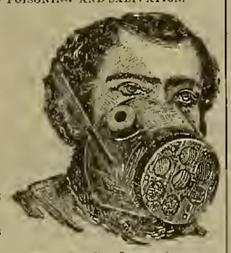
Constantly on hand a full assortment of Manila Rope, Sisa Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc.

Extra sizes and lengths made to order on short notice

TUBBS & CO.,
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Patent Life-Saving Respirator.

PREVENTS LEAD POISONING AND SALIVATION.



Invaluable to those engaged in dry crushing quartz mills, quicksilver mines, white lead corroding, feeding thrashing machines and all occupations where the surrounding atmosphere is filled with dust, obnoxious smells or poisonous vapors. The Respirators are sold subject to approval after trial, and, if not satisfactory, the price will be refunded. Price, $3 each, or $30 per dozen. Address all communications and orders to

H. H. BROMLEY, Sole Agent,
43 Sacramento Street, San Francisco, Cal.

FOR SALE

By J. M. LAKENAN, of Grass Valley Foundry, Grass Valley, Cal.

One 20-inch bore engine, 24-inch stroke; one 18-inch bore engine, 40-inch stroke, Meyer's cut-off; one 14-inch bore engine, 36-inch stroke, Meyer's cut-off; two 12-inch bore engines, 36-inch stroke; two sets heavy pumping gear, with bob and connecting rod irons, etc.; 450 feet of 10-inch pump pipe of ½-inch iron, heavy flanges; besides other mining and milling machinery.

For information, address

J. M. LAKENAN,
Grass Valley, Cal.

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BARTLING & KIMBALL, BOOKBINDERS.

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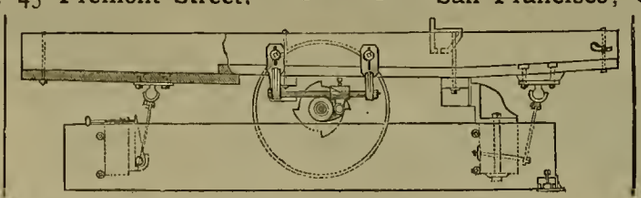
505 Clay Street, (southwest corner Sansome), SAN FRANCISCO.

MILL & MINING MACHINERY.

F. A. HUNTINGTON,

No. 45 Fremont Street. - - San Francisco, Cal.

PATTEN'S



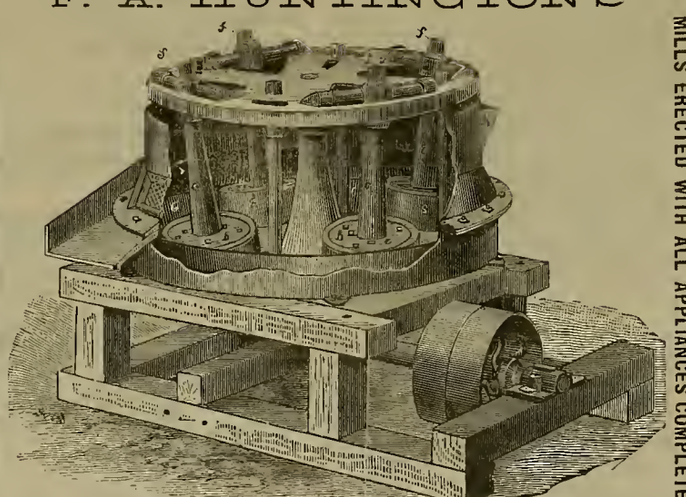
CONCENTRATOR

This machine requires less power, less care or attention, and is less liable to get out of repair than any concentrator now in use. All of which any practical miner will comprehend when seeing it in operation.

The wear and tear is nominal, and the construction so simple that any miner can put it up and run it; and the low price brings it within the reach of all mill men, as it will save enough to pay for itself in any mill in a very short time. One machine will concentrate the tailings from a five-stamp battery.

F. A. HUNTINGTON'S

CAPACITY AND DURABILITY GUARANTEED.



MILLS ERECTED WITH ALL APPLIANCES COMPLETE.

CENTRIFUGAL ROLLER QUARTZ MILL!

After running one of these mills on the Whidden mine, in El Dorado county, over four months, and thoroughly testing its capacity and durability, I am prepared to offer it to the mining public, and claim for it the following advantages over the drop stamp mill:

1. The cost of same capacity is not more than one-half that of stamps.
2. Freight to mine one-fourth that of stamps.
3. Cost of erection at mine one-tenth that of stamps.
4. It runs with one-third the power per ton of ore crushed.
5. The wear is less than that of stamps.
6. The wearing parts are easily duplicated.
7. It has a much better discharge, and leaves the pulp in better condition for concentrating.
8. It is a better Amalgamator, saving fully nine-tenths of the gold in the mill; the balance can be saved on plates in the usual manner.
9. It is continually crushing; not like the stamp, using power to suspend it in air ninety-nine one-hundredths of the time, and the balance making a thundering noise, and accomplishing *comparatively* small results. It is as far in advance of the stamp mill as the present method of making flour with improved rolls is over the Indian's mode of crushing corn in a stone mortar.

F. A. HUNTINGTON, ESQ.—DEAR SIR: Your Centrifugal Roller Quartz Mill has run on the Whidden Gold Mining Company's property, at Shingle Springs, El Dorado county, Cal., about four months, and it did good and satisfactory work; a greater portion of gold remaining in the mill than in a stamp battery.

FRED. JONES, Supt.

SHINGLE MACHINES AND SAWMILL MACHINERY OF EVERY DESCRIPTION.

This paper is printed with Ink Manufactured by Charles Enu Johnson & Co., 5 and South 10th St., Philadelphia. Branch Offices—47 Ross St., New York, and 40 La Salle St., Chicago. Agent for the Pacific Coast—Joseph H. Dorsty, 529 Commercial St. S. F.

LAND Good land that will raise a crop every year. Over 12,000 acres for sale in lots to suit. Very desirable Fruit, Vine, Grain, Vegetable, Hay, and Pasture land. Near Railroad and Sacramento river; $3 to $30 per acre. Wood and water convenient. U. S. Title perfect. Send stamp for illustrated circular, to EDWARD FRISBIE, Proprietor of Reading Ranch, Anderson, Shasta Co., Cal.

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PATENT DETACHABLE TOOTH SAWS,

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TRADE MARK

VALVOLINE

STEAM CYLINDER AND MACHINE OILS,

The Best and Cheapest.

These Superior Oils *cannot* be purchased through *dealer* and are sold direct to *consumer only* by H. H. BROMLEY, sole dealer in these goods

Reference—Any first-class Engine or Machine Builder in America. Address, 43 Sacramento St., S. F.

THE BEST IN USE!

DUC'S IMPROVED ELEVATOR BUCKET

This is the only Scientifically Constructed Bucket in the market. It is struck out from charcoal stamping iron. No corners to catch. No seams to burst. No interior corners to clog up. It runs with great ease, and half the power of the old style bucket. WILL OUTWEAR HALF A DOZEN OF THEM.

PRICES REDUCED.

T. F. ROWLAND, Sole Mfr.
Brooklyn, N. Y.

H. P. GREGORY & CO., Agents, San Francisco, Cal., carry a stock of all sizes.

PACIFIC POWER CO.

Room with steam power to let in the Pacific Power Co.'s new brick building, Stevenson street, near Market. Elevator in building. Apply at the Company's office, 314 California street.

"DUNCAN"

ROCK DRILL!

FOR MINES, QUARRIES, ETC.

J. CUYAS, Agent,
10 Park Place, - - New York.

RICHARD C. REMMEY, Agent,

Philadelphia Chemical Stoneware Manufactory,

1100 East Cumberland St., PHILADELPHIA, PA.



Manufacturer of all kinds of Chemical Stoneware —FOR— Manufacturing Chemists. Also Chemical Bricks for Glover Tower.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F

FOR WEEK ENDING JULY 10, 1883.

281,004.—ROTARY ENGINE—J. J. Blair, Tacoma, W. T.

281,027.—VENTILATION—W. T. Cottier, Napa, Cal.

281,037.—STEAM BOILER—P. F. Dundon, S. F.

280,821.—ROLLER SKATE—W. B. Higgins, S. F.

280,929.—FULLING MILL—R. H. H. Hunt, S. F.

281,084.—SOLAR FRUIT DRIER—W. P. Kirkland, S. F.

280,834.—LIFT PUMP—H. C. Langrehr, S. F.

280,835.—COMPOUND PUMP—H. C. Langrehr, S. F.

281,087.—ENDLESS CHAIN CARRIER FOR COAL—Lesourd & Lotan, Portland, Or.

281,090.—REFRIGERATING AND ICE MACHINE—Hugh Logan, S. F.

280,845.—SCREWDRIVER—A. McLellan, Portland, Or.

281,100.—HEAD-BLOCK GEAR FOR SAWMILLS—M. C. Meeker, Occidental, Cal.

281,114.—INHALER—S. A. Morse, S. F.

280,882.—TREATING ALCOHOLIC LIQUORS WITH ELECTRICITY—A. C. Tichenor, Alameda, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

AN IMPROVED BOOT.—Thos. H. Buckingham, of San Francisco, Cal., assignor to Buckingham & Hecht, of same city. No. 280,443. Dated July 3, 1883. This invention relates to a certain new and useful improvement in boots, consisting in the fashioning of certain parts and their combination so as to form the upper and leg of the boot. The object of the invention is economy in cutting and simplicity in construction, combined with strength and comfort. It is difficult to describe this invention without diagrams or illustrations. Suffice to say that in a boot made after this patent there is no side seam, either on the leg, or at the line where the counter joins the main piece. The latter seam is well known to be the first to give out, and its avoidance is a benefit, both because of this fact and also because of the greater comfort which it gives the wearer.

EXTENSION LADDER AND TRUCK.—Daniel W. Hoover, of Gas Point, Cal. No. 280,475. Dated July 3, 1883. This invention relates to a new and useful extension ladder and truck, the particular object of which is to provide a ready means for picking fruit, for pruning trees, or for any such or similar use. Its portability renders it peculiarly adapted to such work. The extension portion of the ladder is connected with the main portion by means of hinges, placed on the front sides, whereby such extension may turn or fold down forward, but is limited in its upward movement by finding a bearing for its sides on the sides of the main portion of the ladder, in which position it continues the inclination of the main portion. The extension is properly secured by brace bolts, etc., so that a person can mount the extension with perfect safety.

GUN SIGHT.—John C. Kelton, S. F., Cal. No. 280,484. Dated July 3, 1883. This invention relates to certain improvements in the rear sight of rifles generally, but is more particularly adapted for use upon the United States Springfield rifle and carbine, as at present constructed, although it may also be used on other rifles. The object of the invention is to enable the sight to be more quickly and correctly adjusted, and also to provide a better lateral adjustment to counteract the deflection caused by the wind. The invention consists of a base which is fixed to the barrel of the gun, a hinged leaf having side bars which fall outside the base, and a slide which has a movement only in the direction of the length of the bars. This slide carries the sight proper. The sight itself is, in form, the segment of a cylinder, with the notch extending around the curve centrally, so that its depth will be the same at all elevations.

FEED CUP.—Edward J. Thomas, of Oakland, Cal. No. 280,532. Dated July 3, 1883. This invention relates to an improved feed-cup for bird cages, the object of which is to prevent the bird from scattering the seed or other contents of the cup upon the floor of the cage or elsewhere. This object is accomplished by the intervention of a lip or flange placed in the throat of the cup, whereby the seed is guarded from being thrown out in front, while the bird is at the same time prevented from throwing the seed out with his bill.

SAFETY ATTACHMENT FOR RAILWAY TRAINS.—Samuel Brown, S. F., Cal. No. 280,442. This invention relates to a new and useful safety attachment for the cars and locomotive of a railway train, and consists of a peculiar clamp or guard, rigidly secured under the cars, and in a raised bar or rail, with which the clamp or guard is adapted to engage. The object of the invention is to prevent the derailment of a railroad train at sharp curves, or at other dangerous points, where, under speed, the wheels may have a tendency to leave the track.

SEED SOWER ATTACHMENT.—William T. Armstrong, of Soledad, Cal., assignor to Baker & Hamilton, of San Francisco. No. 280,437. Dated July 3, 1883. This invention relates to an attachment for seed sowers, and is especially applicable to that class of implements in which the grain flows through an opening in the bottom of a containing hopper, and is spread by a horizontally rotating disk with distributing arms. It consists of one or more spirally curved arms, which are fixed to the top of a shaft which projects up through the opening in the bottom of the hopper, and which, by their peculiar shape and action, force the grain down in a regular current, which ensures its being sown evenly upon the ground.

INHALER.—Stephen A. Morse, San Francisco, Cal. No. 281,114. Dated July 10, 1883. In the usual articles of this class great care must be taken to avoid blowing through the mouth tube, as this forces the liquid in the bottle up into the acid chamber and destroys the arrangement and effect of the ingredients. Mr. Morse overcame this difficulty by the use of a neat and effective valve which prevents the liquid from rising into the acid chamber when the tube is blown into, but allows the perfect effect of inhalation.

MASONIC EMBLEM.—David W. Laird, of S. F. No. 14,025. This is a new and original design for a Masonic emblem or jewel, consisting of a Maltese cross, in the central portion of which is a shield bearing the coat of arms of the State of California. Upon the outer edge of the arms of the cross any suitable words may be engraven. The cross is suspended by a link from a bar which supports the figure of a grizzly bear. The design is both beautiful and appropriate.

News in Brief.

THE Canadian hop crop promises to be very poor.

JAMES ROBINSON committed suicide at Salt Lake.

THE yellow fever is raging at Callao and Lima.

A STRANGE and fatal horse disease has broken out in Utah.

A GERMAN paper will be established in the city of Mexico.

THERE are 300 bridges on the line of the Utah & Northern railroad.

THE relations between Prussia and the Vatican are still strained.

THE President of Chili advises the separation of Church and State.

MRS. NANCY ADAIR dislocated her neck and fell dead while addressing a prayer meeting in the Cherokee nation.

ALONG the line of the Mexican Central railroad there are twenty-one cities, with an aggregate population of 896,000, and none of them are State capitals.

A CHINAMAN caught a sturgeon weighing 100 pounds, in Feather river, below Oroville, last week. The fish pulled him overboard, but he was rescued by his comrades.

A SQUAW was killed by her buck in Butte valley, White Pine county, Nev., a few days ago, and her murderer was hitched to a horse by members of the tribe and "snaked" to death.

ARE you troubled with such symptoms of dyspepsia as belching, tasting of the food, heart-burn, etc.? Brown's Iron Bitters will cure you.

Seigler Springs.

These Springs are situated about seven miles from Lower Lake, Lake county, and are reached in twelve hours from San Francisco, via Calistoga. The Springs include soda, iron, magnesia, sulphur, arsenic, etc., and have been well tested for a variety of diseases, and their curative properties recommend them to the afflicted. Situated in a beautiful and healthy location, the number of visitors to the place has been steadily increasing, and a fine large hotel has been erected this summer to meet the requirements of increasing patronage. A large swimming bath is one of the attractions of the place, and Mr. F. J. McCullough, the proprietor, spares no pains to accommodate those who pay the Springs a visit. The table is supplied with the best articles obtainable. Those contemplating visiting the springs, either for health or pleasure, will do well in giving Seigler Springs a visit.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

G. W. MCGREW—Santa Clara county.
M. P. OWEN—Santa Cruz county.
J. W. A. WRIGHT—Merced, Tulare and Kern counties.
JARED C. HOAG—California.
B. W. CROWELL—Arizona Territory
M. H. JOSEPH—Eureka, Nev.
I. M. LEIBY—Los Angeles, San Bernardino and San Diego counties.
A. C. KNOX—Oregon and Washington Ter.
J. J. BARTELL—Yolo county.

SEEK

health and avoid sickness. Instead of feeling tired and worn out, instead of aches and pains, wouldn't you rather feel fresh and strong?

You can continue feeling miserable and good for nothing, and no one but yourself can find fault, but if you are tired of that kind of life, you can change it if you choose.

How? By getting one bottle of BROWN' IRON BITTERS, and taking it regularly according to directions.

Mansfield, Ohio, Nov. 26, 1881.
Gentlemen:—I have suffered with pain in my side and back, and great soreness on my breast, with shooting pains all through my body, attended with great weakness, depression of spirits, and loss of appetite. I have taken several different medicines, and was treated by prominent physicians for my liver, kidneys, and spleen, but I got no relief. I thought I would try Brown's Iron Bitters; I have now taken one bottle and a half and am about well—pain in side and back all gone—soreness all out of my breast, and I have a good appetite, and am gaining in strength and flesh. It can justly be called the *king of medicines*.
JOHN K. ALLENDER.

BROWN'S IRON BITTERS is composed of Iron in soluble form; Cinchona the great tonic, together with other standard remedies, making a remarkable non-alcoholic tonic, which will cure Dyspepsia, Indigestion, Malaria, Weakness, and relieve all Lung and Kidney diseases.

The Home School for Young Ladies
OAKLAND, CAL.

The Home School, which has hitherto been under the management of Miss H. N. Field, now deceased, will be re-opened on the 25th inst. under the personal supervision and care of Miss Lucy A. Field and Miss Caroline H. Field, her sisters. The Misses Field, who now assume control, were formerly connected with this school for four years ending September, 1877, and have also had large experience as teachers of young ladies in the East. They assure its former friends and patrons and the public, that no effort or expense will be spared to maintain the high reputation which this school has attained. The best teachers in all branches will be provided, and every care and attention bestowed upon the physical, mental and moral welfare of those committed to their charge. Terms for boarders and day pupils as heretofore. Further information may be had by letter or personal application at the school, 1825 Telegraph avenue, Oakland, Cal.

DIVIDEND NOTICE.

The German Savings and Loan Society.

For the half year ending June 30, 1883, the Board of Directors of the GERMAN SAVINGS AND LOAN SOCIETY has declared a dividend on Term Deposits at the rate of four and thirty-two one-hundredths (4 32-100) per cent per annum, and on Ordinary Deposits at the rate of three and six-tenths (3 6-10) per cent per annum, free from Federal Taxes, and payable on and after the 2d day of July, 1883. By order,

GEO. LETTE, Secretary.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $4 a year, in advance. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times,) by turning a leaf.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

Mining Companies.

Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

Seaton Gold Mining Company.—Location

of principal place of business, San Francisco, California. Location of works, Drytown, Amador county, California.

NOTICE.—There are delinquent upon the following described stock, on account of Assessment No. 2, levied April 10, 1883, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No Certificate.	No Shares.	Amount.
Scott, F A	4	10	$ 75
Warner, Alex	5	10	75
Martin, A, Trustee	6	5,000	375 00
Martin, A, Trustee	7	5,000	375 00
Martin, A, Trustee	8	5,000	375 00
Martin, A, Trustee	9	5,000	375 00
Martin, A, Trustee	10	1,000	75 00
Martin, A, Trustee	11	1,000	75 00
Martin, A, Trustee	12	1,000	75 00
Martin, A, Trustee	13	1,000	75 00
Martin, A, Trustee	14	1,000	75 00
Martin, A, Trustee	15	1,000	75 00
Martin, A, Trustee	16	1,000	75 00
Martin, A, Trustee	17	1,000	75 00
Martin, A, Trustee	18	1,000	75 00
Martin, A, Trustee	19	1,000	75 00
Martin, A, Trustee	20	500	37 50
Martin, A, Trustee	21	500	37 50
Martin, A, Trustee	22	500	37 50
Martin, A, Trustee	23	500	37 50
Martin, A, Trustee	24	500	37 50
Martin, A, Trustee	25	500	37 50
Martin, A, Trustee	26	500	37 50
Martin, A, Trustee	27	500	37 50
Martin, A, Trustee	28	500	37 50
Martin, A, Trustee	29	500	37 50
Martin, A, Trustee	30	4,000	300 00
Martin, A, Trustee	31	900	67 50
Davis, John A	32	90	6 75
Martin, A, Trustee	33	5,000	375 00
Martin, A, Trustee	34	5,000	375 00
Martin, A, Trustee	35	5,000	375 00
Martin, A, Trustee	36	4,900	367 50
Kellogg, C W	37	100	7 50
Martin, A, Trustee	38	5,000	375 00
Martin, A, Trustee	39	5,000	375 00
Martin, A, Trustee	40	5,000	375 00
Martin, A, Trustee	41	5,000	375 00
Martin, A, Trustee	42	5,000	375 00
Martin, A, Trustee	43	10,000	750 00
Fischer, Bertha C	45	100	7 50
Cornwall, P B	46	4,800	366 75

And in accordance with law and an order of the Board of Directors, made on the 10th day of April, 1883, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at 528 California St., Room 6, San Francisco, Cal., on TUESDAY, the 5th day of June, 1883, at the hour of 1 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

A. MARTIN, Secretary.

OFFICE—Room 6, 528 California St., San Francisco, California.

POSTPONEMENT.

The above sale of delinquent stock is hereby postponed to THURSDAY, the 28th day of June, 1883, at 1 o'clock P. M., at the same place. By order of the Board of Directors.

A. MARTIN, Secretary.

San Francisco, June 6, 1883.

The above sale of delinquent stock is hereby postponed to THURSDAY, July 26, 1883, at 1 o'clock P. M., at the same place. By order of the Board of Directors.

A. MARTIN, Secretary.

San Francisco, June 28, 1883.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company.

San Francisco, July 2, 1883.

At a meeting of the Board of Directors of the above named company held this day, Dividend No. 56, of twenty-five cents (25c.) per share, was declared, payable THURSDAY, July 12, 1883, at the Farmers' Loan and Trust Company, in New York, or at the office in this city.

WILLIAM WILLIS, Secretary.

OFFICE—Room No. 29, Nevada block, No. 309 Montgomery street, San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Bulwer Consolidated Mining Company.

San Francisco, June 21, 1883.

At a meeting of the Board of Directors of the above named company, held this day, Dividend No. 18, of fifteen cents (15c.) per share, was declared, payable on Monday, July 2, 1883. Transfer books closed on Saturday, June 23, 1883, at 12 o'clock M. This dividend is payable at the Farmers' Loan and Trust Company in New York, on all stock issued there, and at the office in this city on all stock issued here. WM. WILLIS, Secretary.

OFFICE—Room 29, Nevada Block, No. 309 Montgomery Street, San Francisco, Cal.

ASSESSMENT NOTICE.

Gould and Curry Silver Mining Company.

ASSESSMENT No. 45.

Levied ..... June 15, 1883
Delinquent ..... July 20, 1883
Day of Sale ..... August 13, 1883
Amount ..... Fifty cents per share.

ALFRED K. DURBROW, Secretary.

OFFICE—Room No. 69, Nevada Block, No. 309 Montgomery Street, San Francisco, Cal.

BOUND VOLUME OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half yearly) volume. In cloth and leather binding, $8. These volumes, complete, are scarce, and valuable for future reference and library use.

"Challenge" Ore Feeders.

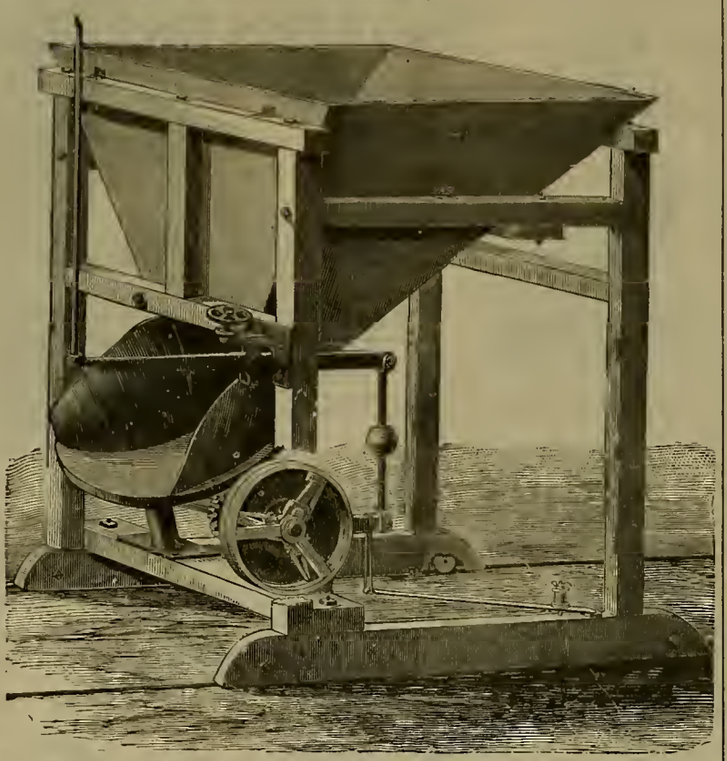
OVER 1100 HAVE BEEN IN SUCCESSFUL OPERATION.

Awarded First Premiums at the Preceding and last Industrial Fairs of the Mechanics' Institute of San Francisco.

TWENTY PER CENT. MORE ORE CRUSHED WITH FIFTEEN PER CENT. LESS WEAR OF IRON THAN BY THE OLD METHOD OF HAND-FEEDING.

The opposite cut illustrates the recently-introduced Grip and Spring Attachment, which replaces the Weight originally used and result in an obvious improvement.

The practical operation of the large number of these machines now in use demonstrates the fact that the principle upon which a perfect Ore Feeder must be constructed is that of a *carrier* and not that of a shaking table. Uniform feeding is not possible upon the latter plan. The ore must be *evenly carried* upon a steadily advancing plane or table to the flue or point of discharge, and there be simply dropped. Jerky or spasmodically acting contrivances will not answer the purpose for feeding wet or sticky ores, nor for the ores of mines where they may change from sharp quartz to an intermixed material of quartz and earthy matter.



The e Feeders are in Successful Practical Operation in the following Quartz Mills, and are giving Perfect Satisfaction to their Managers.

Compromise	10 Stamps	Mariposa county, Cal.	
Souleby	20 "	Tuolumne	" "
Patterson	20 "	"	" "
Sheep Ranch	20 "	Calaveras	" "
Mahoney	40 "	Amador	" "
Zelle	40 "	"	" "
Pacific	40 "	"	" "
Nashville	20 "	El Dorado	" "
Gross	80 "	"	" "
Julian	20 "	Placer	" "
St Patrick	15 "	"	" "
Providence	40 "	Nevada	" "
Empire	20 "	"	" "
Idaho	30 "	"	" "
Green Mountain	60 "	Plumas	" "
Plumas-Eureka	60 "	"	" "
Bulwer-Standard	30 "	Bodie,	Mono, "
Standard	20 "	"	" "
Noonday	30 "	"	" "
Big Dry Creek	10 "	Fresno	" "
Mexican	44 "	Lyon county,	Nevada.
Santiago	32 "	"	" "
Vivian	16 "	"	" "
Christy	5 "	Uintah,	county, Utah.
Contention	20 "	Tombstone,	Arizona.
Grand Central	20 "	"	"
Sunshine	20 "	Black Hills,	Dakota.
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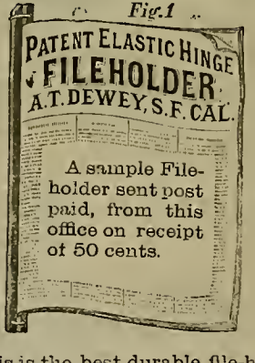
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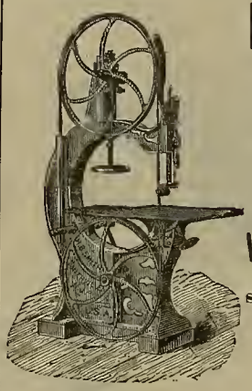
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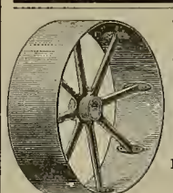
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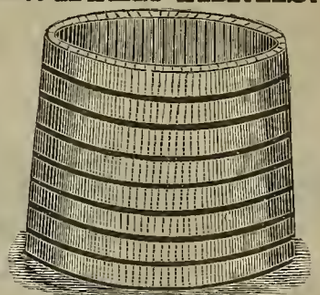
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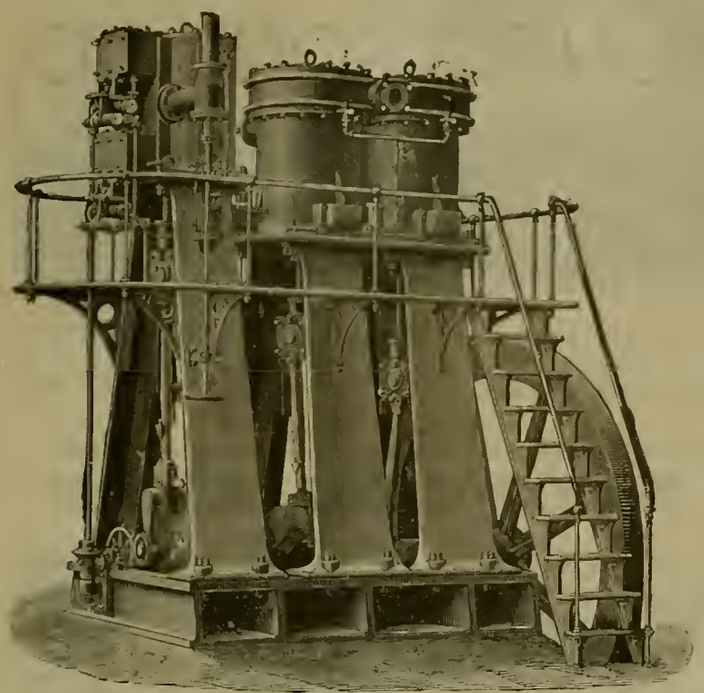
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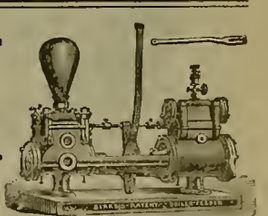


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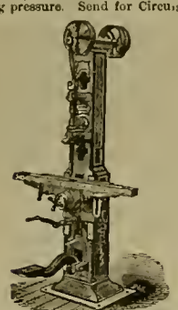
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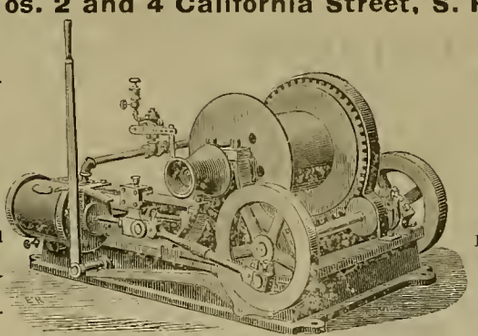


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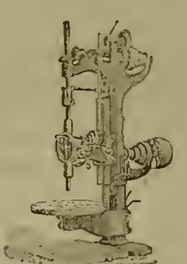




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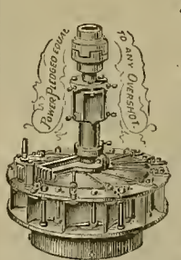
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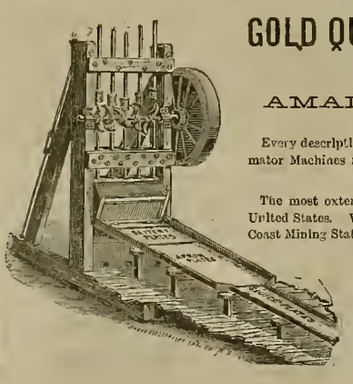
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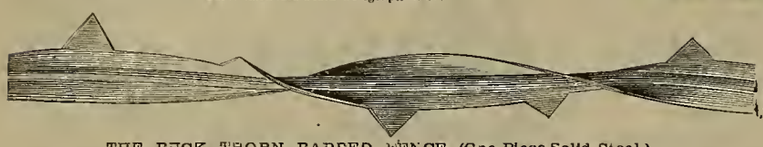
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For Inclined Planes, Standing Ship Rigging, Suspension Bridges, Ferries; for Mines and all kinds of Heavy Hoisting; for Stays and Guys on Derricks, Cranes and Shears; for Tillers, Sawmills, Sash Cords, Lightning Conductors, etc.
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Derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.

HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in use, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fumes, notwithstanding bombastic and pretentious claims by others.

No. 1 (XX) is the Strongest Explosive Known.

No. 2 is superior to any powder of that grade

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MANUFACTURERS OF

Sporting, Cannon, Mining, Blasting and HERCULES Powder.

ORDERS RECEIVED FOR HERCULES CAPS AND FUSE.

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Office, No. 230 California Street, - - - - San Francisco, Cal.



EXCELSIOR BLASTING POWDER,

Manufactured by the

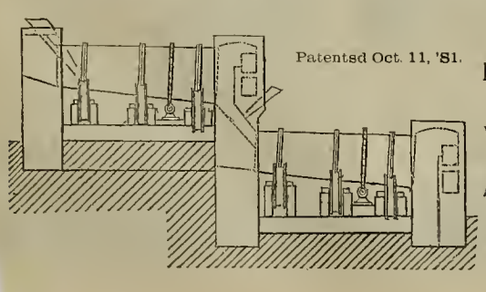
EXCELSIOR POWDER COMPANY.

This is no new, patent, non-explosive Safety Powder, but the Genuine Standard Nitro Glycerine Powder, as safe to use and handle as any other Nitro-Glycerine Powder manufactured. The fumes and gases, common in nitro-glycerine powders, are destroyed, and do not leave the miner with headache or nausea.

The powder is put up in cartridges of any size to suit the consumer, and is exploded in the same manner as all other high explosives; that is, by means of cap and fuse, or by electricity. It is not claimed for this powder that it is a non-explosive, or safer than other nitro-glycerine powder. All powder, and especially nitro-glycerine powder, should be handled carefully. The EXCELSIOR POWDER is as safe, and for strength far surpasses any other powder on the market. Address all orders to

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Patentsd Oct. 11, '81.

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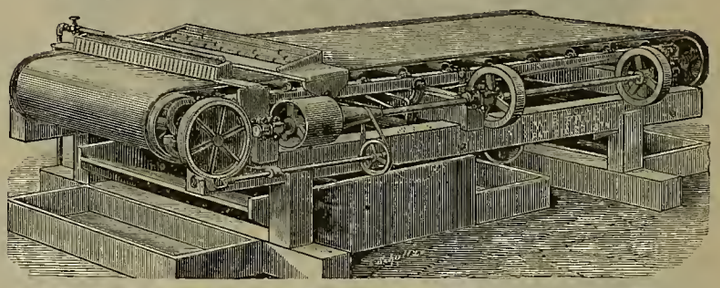
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—OR—

VANNING MACHINE.

Over 400 are now in use, giving entire satisfaction. Saves from 40 to 100 per cent. more than any other Concentrator in use, and concentrations are clean from the first working. The wear and tear are merely nominal.

A machine can be seen in working order, and ready to make tests, at the office of Hinckley, Spiers & Hayes, 220 Fremont Street.

To those intending to manufacture or purchase the so-called "Triumph" Concentrator, we herewith state:

That legal advice has been given that *all shaking motion* applied to an *endless traveling* belt used for concentration of ores is an infringement on patents held and owned by the Frue Vanning Machine Company.

That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.

That the patent laws make *users* of infringements responsible as well as makers, and the public is therefore warned that there is considerable risk in purchasing any end-shake machine until our various patents have been decided.

That if there are those who for any reason prefer an end-shake machine, we can manufacture and sell to such a machine of that description, as efficient as the Triumph, and at a lower price, and no liability for infringement will then be incurred by the purchaser.

That we shall protect ourselves against any one making, selling or using any machine infringing any of our patents. Patented July 9, 1867; May 4, 1869; Dec. 22, 1874; Sept. 2, 1879; April 27, 1880. Patents applied for.

That we are, and have been, ready at any time, to make a competitive trial against the Triumph, or any other machine, for stakes of $1,000.

ADAMS & CARTER, Agents Frue Vanning Machine Company,

Room 7, 109 California Street, - - - SAN FRANCISCO, CAL.

Nov. 6, 1882.

L. M. STARR. G. H. MALTER.

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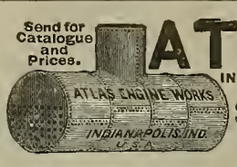
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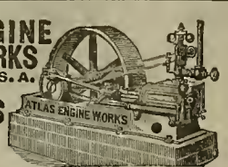


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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, JULY 28, 1883.

VOLUME XLVII Number 4.

Treating Gold-Bearing Clays.

In alluvial formations auriferous, but tenacious clay is often found. Special implements have, therefore, been devised for treating such gold-bearing clays, and these are known as puddling machines. The original and most simple form is the puddling box, a rough wooden box about six feet square and eighteen inches deep; or even half a large barrel is commonly used, where operations are conducted on a small scale. Into this the clay is thrown, and supplied with plenty of water. The mixture is then stirred constantly with a shovel, prong or rake, till the clay is thoroughly disintegrated and suspended in the water, when a plug, inserted near the bottom of the tub, is withdrawn, and the thin mud, or rather muddy water, is allowed to escape. A fresh supply of clay and water is now admitted, and the stirring process is repeated; this continues until the box has become filled with gravel, sand, etc., to the level of the plug hole, when operations are suspended, and the deposit containing the gold, if there was any in the material treated, is taken out and washed up in a cradle or pan. Where operations are more extended, an upright shaft, furnished with strong arms, is placed in the center of the tub, and set in motion by a miter wheel, driven by horse or steam power. In this State puddling is seldom resorted to, though it is occasionally. In Australia, on the other hand, water is not so plentiful, and there the puddling machine is in common use. It consists of a circular space, whose sides and bottom are lined with hard wood or iron, and in the center of which revolves a perpendicular shaft worked by horse power. From the cross beam on this shaft depend two harrows, which are dragged round the circle, and puddle the dirt on their way. Sufficient water must, of course, be continually supplied. The gold and sandy matters collect at the bottom of the circle, and are removed at intervals and panned out.

A sketch plan and sections of a combined cradle and puddling machine, which we take from Alfred G. Lock's new work on "Gold," presented by Spon & Co., are shown in the accompanying figure.

The necessary power is derived from an overshot water wheel, eight feet in diameter, which communicates with the puddling shaft by two drums and a belt, and with the cradle by means of a rod connected with a crank fixed at the other end of the puddling shaft. The wash-dirt is thrown into the puddling trough, which is supplied with water, and in which revolves an axle furnished with twenty-five iron arms. Hence the wash-dirt mixed with water flows into the hopper at the top end of the cradle. The bottom of this hopper is of sheet iron, perforated with 3-16 inch holes. In the cradle are seven tiers of blanket tables, made of ¼ inch pine boards, and varying in length so that each one receives its due proportion of sludge from the hopper. The blankets are washed three times a week, and the slime is concentrated in an ordinary small cradle, the gold being finally amalgamated. The plan and sections are drawn to a scale of 6 feet = 1 inch. The cradle has an inclination of 6 inches and an oscillation of 12 inches.

THE construction of railroads this year has fallen off nearly one-half from the number of miles constructed the first of last year—2,509 miles, as against 4,990 miles last year.

Mining Improvements.

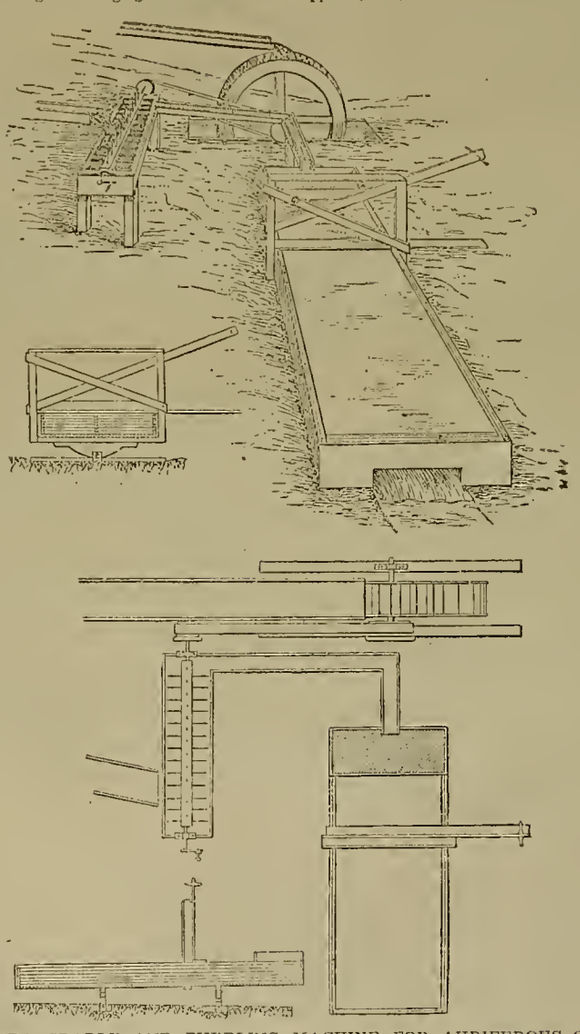
In conversation this week with Mr. Martin White, the well known mining man, we were pleased to hear him say that, in his opinion, mining matters in California will be much better for the next ten years than they have been in the past decade. He has traveled extensively through the State, and is an owner of considerable mining property, and it is his conviction that our mining interests are gradually improving. As long ago as the Comstock excitement, people left good properties here to prospect for silver in Nevada. Ever since then mining property in this State has been comparatively neglected. Lately, however, a decided improvement has taken place, and old properties have been re-opened in many parts of California. New mines have been opened too, which are being developed by persons of experience. Mr. White feels confident that California's mining interests are advancing in a very satisfactory manner.

Mr. White owns an interest in a drift claim at Snow Point, up above Moore's Flat, Nevada county. Some very rich specimens have been sent down from there of late, and recent news is very encouraging. He also has an interest in a mine near the famous Rainbow, Chipp's Flat, Sierra county. His mine is next the Gold King, owned by Mr. Wilder. The Gold King struck quartz at 100 feet deep, assaying $1,194.82 per ton. It is on the same lead as the Rainbow. Mr. White's claim is known as the Albany. He thinks the mining interests of Sierra county are greatly improving.

He has recently visited Arizona, going to the Copper Queen, at Bisbee, Tombstone mines, etc. The best prospect for a continued large camp in the Territory is at the latter place, in his opinion. The mining properties there, he is assured, will continue to pay largely for a long time to come.

Altogether, Mr. White considered the state of the mining industry as very encouraging indeed. Everywhere are indications of prosperity and improvement.

REPORTS from the Silver Mountain, Big Cottonwood, continue very encouraging. The big ore body is improving and the road to the mine is being pushed ahead vigorously.



COMBINED CRADLE AND PUDDLING MACHINE FOR AURIFEROUS CLAYS.

Prevention of Mining Accidents

Within the past few years, and last year particularly, so much care has been taken in Great Britain for the prevention of mining accidents, that a very marked decrease has become apparent. During the first half of 1883, there has been a singular, and what may almost be termed an extraordinary, immunity from explosions of a fatal character throughout the kingdom, when they come to be compared with similar occurrences in the corresponding periods of previous years. So far as can be ascertained, the number of fatal explosions to the end of June, was three, and the killed, only six, against 187 for the corresponding half year of 1882. But each of these three explosions were really preventable, so that with proper precaution, there should have been no death whatever from such a cause. Still, it is gratifying to find such a satisfactory state of things, which, in all probability, may be attributed to the introduction of more perfect systems of ventilation, the use of the best safety lamps, and the doing away with powder for blasting in many districts. It may be said that those localities where the mines are considered the most fiery, and where, in former years, the most terrible explosions recorded have taken place have, so far as the year has gone, been free from explosions. This has been the case as regards Yorkshire, Durham, Lancashire and Staffordshire, whilst only two persons were killed in South Wales.

When it is considered how large a mining field is covered, and how many thousands of miners are working underground in the deep English mines, this immunity from accident is remarkable. And it must be remembered, moreover, that a large number of the mines being worked are fiery, and liable to explosion at any time carelessness occurs. All three of the explosions referred to were due to naked lights.

The English government exercises close scrutiny, its duly appointed officials properly inspecting all matters relating to the mines where there is liability of accident. Managers have to pass examination as to their knowledge of appliances for working mines, and understanding of causes and prevention of accident. Everything is so systematic now, and such careful inquiry is made when accidents do occur, that, feeling the responsibility, the managers, inspectors and foremen have been made extremely cautious. This system is bearing fruit as the result of this year's working is shown. The number of accidents and losses of life has been greatly decreased. This shows that due care was all that was necessary, and that by properly guarding everything and exercising precaution, liability to accidents in mines is largely lessened.

THE WATER-EJECTOR IN MINING.—In the Bleiberg district, Austria, an application of the ejector has been made in mining. It is driven there by hydraulic power, to raise the water from a winze. It lifts 366 gallons a second from a depth of 92 feet, using 435 gallons of power water with a head of 617 feet, thus showing an efficiency of 12 per cent. It is expected, however, that this power will suffice to carry the winze down to 200 feet, so that the efficiency would then be fully 20 per cent. The ejector is now working only six hours a day, doing the work of 16 men at hand pumps in 24 hours. This system is, therefore, worthy of the attention of those who must sink at isolated points below a tunnel level in which a head of water is available.

CORRESPONDENCE.

Letter from New Mexico.

EDITORS PRESS:—I send you herewith a few items about the mines in this part of New Mexico. Our camp lies in the northwestern corner of Grant county, near the line of Arizona, eighteen miles from the copper mines at Clifton, and on the same belt. The leads carry copper, gold and silver—formation, porphyry, granite and syenite. The silver occurs in the form of black sulphurets and horn silver, the gold being included in the same rock. The copper lies principally in beds by themselves.

There are here a number of claims on which work has been done. Among these are the Mitchell, having one ninety and one fifty-foot shaft, and one hundred tons of ore on dump, averaging $96.60 silver and $5 gold per ton, and the Tuck mine, with the same amount of work, and ore out. The Silver Rain has two hundred and ten feet of work done on it—one shaft one hundred feet deep, another fifty feet deep, with sixty feet of drifts—and two hundred and fifty tons of ore on dump, averaging seventy-five ounces silver and $16 gold per ton. We have had a thorough sample made of our ores with the result above, which beats the Tombstone mines.

The Little Emily, the Great Eastern, Nugget, Diamond, Eagle, Rose, Rainbow, and a number of other mines, all look as well as those mentioned for the amount of work done on them.

In the West Camp, three miles from us, the Carlisle mine, which has a twenty-stamp mill, is turning out bullion in considerable quantities. The output of April was $48,000, with ten to fifteen stamps, and for May, under twenty stamps, some $65,000. The above are all in the Steeple Rock mining district.

Wood and water not over-plenty, but plenty of water will be reached in depth, and wood will last until the railroad gets through. The nearest depot is twenty miles off, with good roads to it. From Lordsburg on the railroad to Duncan is thirty-eight miles, and nine miles from there to this camp.

ARTHUR H. CADWELL.

Richmond, Grant Co., N. M., July 3, 1883.

The Boss Copper Smelters.

Two men, who are working at the Crown Point mine, Gold Hill, recently went out to the Ludwig copper mine, Mason valley, and melted up everything in sight in the shape of ore.

There was out there a thirty-ton water-jacket furnace, but none of the scientific smelters had ever been able to make it pay or do much with it. The men who went out from the Crown Point are two Baltimore boys—practical copper smelters. The father of one of the men has a copper-smelting establishment in Baltimore. The other has been all through Arizona, where he worked at the Copper King and other mines.

The pair took hold of the furnace out at Mason valley, and made a success of it from the start. They ran through 639 tons of ore—everything that was on the dump, just as it came out of the mine—and extracted over seventy tons of copper, which was molded into ingots, weighing from 100 to 700 pounds.

They used as fuel coke and charcoal, and say they can work to a big profit any ore that goes ten per cent in copper. They say there are plenty of mines in Mason valley and all through that region which yield ore very much richer than that worked by them at the Ludwig mine, and if any one wants it smelted, all he has to do is to put up a furnace and let them at it.

They say the ores here are just as easily smelted as any they have ever seen in Arizona or anywhere else. The young man who was down in Arizona says he has seen the same trouble with furnaces in that country, when professors from the colleges undertook to run them. He says they understood very well what to put into the furnaces, and all the chemical part of the business, but that was the end of their knowledge. When the furnace was charged and fired up, they had no practical knowledge in regard to running it, and failed without knowing why, but generally found fault with the construction of the furnace.

Out here at the Ludwig mine the two men ran through the whole dump, just as it was taken from the mine. The ore contains a good deal of cobalt and nickel, but they shoveled it all in together and brought it out in bars. Much richer ore than that they worked can be found in the Ludwig mine, but they determined to make a success of the whole mass as dug down.

The mine is twenty-five miles from the Carson & Colorado railroad. The station at which they take off coke for the furnace and to which they haul their bars is Stinking Wells. The Jones family—Senator J. P. and Sam—are principal owners of the Ludwig mine. The boys who did the smelting have our thanks for a neat little bar of copper weighing about a pound. They can be found at the Crown Point mine by anyone who has a furnace that he can't run and ore that will go ten per cent and over. —*Territorial Enterprise.*

BOOMING.—The Colorado river is higher at the present time than it has been for eight years, and the current is so strong that it is with great difficulty boats can be made fast to the shore. The large ropes, known as "hawsers," are snapped in two, as though they were but twine. The low bottoms along the river are all under water.

Our Local Industries.

Number of Persons Employed—Material Used and Value of Manufactures as Shown by the Assessor's Report.

The following statistics, showing the condition of the manufacturing and labor interests of this city during the fiscal year ending June 30, 1883, have just been completed in the office of Assessor Holtz. The figures give the number of establishments conducting the various branches of industry, the number of men, women, and boys employed in each, amount of material used and value of goods manufactured:

Agricultural implements manufactories, 2—Men employed, 60; value of manufactures, $120,000.

Air compressors manufactory, 1—Men employed, 10; value of manfactures, $7,000.

Artificial stone manufactories, 1—Men employed, 60; value of manufactures, $120,000.

Axle grease manufactories, 2—Men employed, 9; resin consumed yearly, barrels, 1,428; butter consumed yearly, pounds, 33,000; chemicals consumed yearly, pounds, 28,000; value of manufactures $49,000.

Barrel manufactories, 3—Men and boys employed, 250; barrels, half-barrels and kegs made annually, 453,000; horse-power of steam engines, 112; barrels made for use of sugar refineries, 104,000; syrup kegs made by tub and pail factories, 18,000; aggregate value of manufactures, $330,000.

Bag manufactories, 3—Men, women and boys employed, 340; aggregate value manufactured, $2,000,000; number of bags manufactured, 9,000,000.

Bedspring manufactories, 4—Men employed, 24; coppered wire used, tons, 166; aggregate value manufactured, $104,000.

Iron bedstead manufactories, 2—Men employed, 5; value of manufactures, $10,000.

Bellows manufactories, 2—Men employed, 6; bellows manufactured, 1,600; value of manufactures, $20,000.

Bedding manufactories, 7—Men employed, 100; value of manufactures, $350,000.

Billiard table manufactories, 3—Men employed, 19; billiard tables made, 120; value of manufactures, $16,000.

Boot, shoes and slippers manufactories, 138—Men women and boys employed, 3,400; value of manufactures $5,400,000.

Box manufactories (wooden), 6—Men employed, 330; horse-power of steam engines, 330; lumber used, feet, 14,500,000; value of manufactures, $600,000.

Box manufactories (paper), 3—Men, women and boys employed, 100; number of boxes made annually, 2,250,000; value of manufactures, $75,000.

Box manufactories (cigar), 3—Men, women and boys employed 260; number of boxes made annually, 2,250,000; value of manufactures, $265,000.

Brass foundries, 6—Men employed, 350; value of manufactures, including copper, 500 ton, $535,000.

Breweries, 34—Men employed, 356; hops consumed annually, pounds, 650,000; barley consumed annually, tons, 28,000; beer made annually, barrels, 320,000; aggregate value of manufactures, $2,205,000.

Broom manufactories, 10—Men employed, 65; value of manufactures, $230,000.

Brush manufactories, 6—Men employed, 67; value of manufactures, $137,000.

Candle manufactories, 2—Men employed, 70; candles manufactured, boxes, 150,000; value of manufactures, $350,000.

Clothing manufactories, 17—Men and women employed 2,300; value, including overalls, suits and underwear, $3,750,000.

Cigar manufactories, 223—Men, women and boys employed, 7,478; cigars made annually 102,900,000; cigarettes made annually, 15,000,000.

Cracker manufactories, 3—Men employed, 155; horse-power of engines, 110; aggregate value of manufactures, $500,000.

Chemical works, 2—Men employed, 52, nitrate soda used, ton, 1,800; sulphur used, tons, 1,860; nitric acid produced annually, pounds, 2,560,000; sulphuric acid produced annually, pounds, 10,501,000; muriatic acid produced annually, pounds, 423,600; value of manufactures, $520,000.

Carriage and wagon manufactories, 30—Men employed, 290; carriages and wagons made annually, 550; aggregate value of all branches, $100,000.

Car manufactories, 1—Men employed, 10; number of cars manufactured, 100; value of manufactures, $60,000.

Coffee and spice mills, 16—Coffee ground and roasted annually, pounds, 3,980,000; chocolate made annually, pounds, 450,000; spices ground annually, pound, 656,000; aggregate value of manufactures, $900,000.

Coffin manufactories, 1—Men employed, 11; aggregate value of manufactures, $20,000.

Coppersmiths, 1—Men employed, 33; value of manufactures, $126,000.

Cordage and rope manufactory, 1—Men employed, 150; hemp rope manufactured, tons, 3,000; horse-power of engines, 250; aggregate value of manufactures, $600,000.

Carriage and locomotive car spring manufactory, 1—Men and boys employed, 16; springs made, tons, 150; aggregate value of manufactures, $40,000.

Cutlery manufactories, 2—Men employed, 30; aggregate value of manufactures, $47,000.

Dry dock (floating), 2—Men employed, 15; capacity of docks (one 1,800 and one 800 tons), 2,600.

Dry dock (stone), 1—Length of excavation in solid rock (feet), 450; width of top (feet), 120; depth (feet), 30; width of entrance (feet), 90; capacity of length (feet), 425; capacity of drawing (feet), 20; capacity of pumps for clearing (per hour cubic feet), 325,368; tubular boilers of four-inch tubes, 4; dimensions of each boiler (diameter in inches), 25; dimensions each boiler (length in feet), 16; fire surface of boilers (square feet), 3,800; men employed, 6. Total cost of work, $675,000.

Electric machinery works, 1—Men employed, 30; capital employed, $10,000.

Elevator manufactories, 3—Men employed, 24; aggregate value of manufactures, $140,000.

Fringe factories, 2—Men and women employed; 90; aggregate value of manufactures, $85,000.

Flour and feed mills, 8—Men employed, 192; flour made annually, barrels, 375,000; hominy made annually, tons, 100; buckwheat and rye flour annually, tons, 650; oatmeal and groats annually, tons, 2,000; cornmeal and farina annually, tons, 4,500; feed barley, tons, 10,000, cracked wheat, tons, 320; split peas, tons, 232; graham flour, barrels, 1,600; cracked corn, tons, 2,040; ground feed, tons, 2,000; pearl barley, tons, 650.

Foundries, boiler and iron works, 17—Men employed, 2,400; pigiron, annually, tons, 24,200; bar iron used annually, tons, 25,600; rivets used annually, tons, 480; horse-power of engines, 2,100; California iron used to June 30th, tons, 7,000; aggregate value of manufactures, $4,700,000.

Fur manufactures, 3—Men and women employed, 150; aggregate value of manufactures, $500,000.

Furniture manufactories, 19—Men employed, 1,350; lumber used annually, feet, 7,000,000; aggregate value of manufactures, $2,328,000.

Gas works, 2—Men employed, about 460; capital stock, $12,000,000.

Glass works, 1—Men and boys employed, 180; furnaces, 2; pots, 14; aggregate value of manufactures, $175,000.

Glass cutting, 3—Men employed, 25; value of manufactures, $55,000.

Glove manufactories, 12—Men and women employed, 160; aggregate value of manufactures, $230,000.

Glue manufactories, 2—Men employed, 41; glue made, tons, 220; neatsfoot oil, gallons, 30,000; aggregate value of manufactures, $117,000.

Gutta percha and rubber manufactories, 2—Men employed, 8; sets machinery, 2; aggregate value of manufactures, $24,000.

Hat and cap manufactories, 18—Men employed, 80; aggregate value of manufactures, $275,000.

Hose and belting, 4—Hose made annually, feet, 1,800; belting made annually, feet, equal to one inch, 700,000; aggregate value of manufactures, $150,000.

Harness manufactories, 50—Men employed, 440; aggregate value of manufactures, $1,150,000.

Ink and muscilage, 1—Men employed, 13; number of dozen made annually, 13,000; aggregate value of manufactures, $18,000.

Ice manufactories, 3—Men employed, 15; tons made annually, 1,200; capital invested, $90.000.

Iron working machines, 2—Men employed, 35; value of manufactures, $125,000.

Japanning and galvanizing manufactories, 2—Men and boys employed, 20; aggregate value of manufactures, $4,800.

Jewelry manufactories, 16—Men employed, 175; aggregate value of manufactures, $650.000.

Laundries, white, 105—Men, women and boys employed, 935.

Laundries, Chinese, 186—Men employed, 1,300.

Lead pipe and shot manufactory, 1—Men employed, 30; lead pipe and shot made, tons, 1,750; horse power of engines (2) 500; aggregate value of manufactures, $200,000.

Lead smelting works, 1—Men employed, 116; horse power of engine, 60: aggregate value of manufactures, $400,000.

Last manufactories, 2—Men employed, 14; horse power of engines, 22; lasts manufactured annually, 29,000; aggregate value of manufactures, $12,000.

Linseed oil works, 2—Men employed, 60; oilcake, tons, 4,300; capacity of works yearly, gallons, 8.000,000; value of oil, $580,000; value of cake, $135,000.

Macaroni and vermicelli factories, 8 Men and boys employed, 56; macaroni and paste made, boxes, 200,000; flour used, barrels, 12,000; horse power of engines, 110; aggregate value of manufactures, $200,000.

Marble works, 35—Men employed, 180; aggregate value of manufactures, $290,000.

Match factories, 2—Men employed, 90: matches made annually, gross, 300,000; value of manufactures, $125,000.

Malt houses, 6—Men employed, 100; grain malted annually, tons, 30,000; value of products, $160,000.

Mirror manufactories, 2—Men employed, 9; number of square feet manufactured, 5,500; capital invested, $190,000.

Musical instrument manufactories, 2—Men employed, 35; aggregate value, $40,000.

Oil clothing manufactories, 4—Men employed, 35; aggregate value of manufactures, $60,000.

Oakum manufactory, 1—Men employed, 20; bales made annually, 13,000; aggregate value of manufactures, $52,000.

Pickle and fruit-preserving manufactories, 12 Men and women employed, 2,000; fruit and meat put up, dozen cans, 600,000; pickles put up in kegs, 90,000; aggregate value of manufactures, $1,600,000.

Provisions packing, 2—Men employed, 160; meat, packed, barrels, 10,000; pork packed, barrels, 10,500; ham and bacon, pounds, 3,000,000; lard, pounds, 2,300,000; tallow, pounds, 1,300,000; value of investment in real estate, fixtures, etc., $165,000; aggregate value of products, $2,000.000.

Rolling mill, 1—Men employed, 540; horsepower of engines, 725; scrap-iron used, tons, 26,095; coal consumed, 18,956; aggregate value of manufactures, $1,868,320.

Salt works, 3—Men employed, 32; run of stones, 8; number of tons annually, 30,000; aggregate value of salt ground, $250,000.

Safe and vault works, 4—Men employed 20; bar and plate-iron used, tons, 53; horse-power of engines, 60; steel used, tons, 35; aggregate value of manufactures, $95,000.

Saw manufactories, 2—Men employed, 41; horse-power of engines, 44; steel used annually, tons, 61; aggregate value of manufactures, $122,000.

Sash and doorblind and finishing manufactories, 15—Men employed, 1,550; horse-power of engines, 1,050; lumber consumed annually, feet, 10,055,000; aggregate value of manufactures, $5,010,000.

Silverware manufactories—Men employed, 45; aggregate value of manufactures, $150,000.

Shipyards 4—Men employed 200; number of steamers, barges and other vessels built, 33; tonnage, 6,000; aggregate value of crafts built, $500,000.

Shirt manufactories, 7—Men and women employed, 2,550; value of manufactures, $950,000.

Soap manufactories 17—Men employed, 130; soap made annually, 15,256,000 pounds; aggregate value of manufactures, $715,000.

Soda works (bi-carb soda and saleratus), 1—Men employed, 10; salsoda manufactured 800 tons; saleratus manufactured, 400 tons; value of manufactures, $100,000.

Sugar refineries, 2—Men employed, 360; sugar (raw used), 80,000,000 pounds; white sugar made, 50,000,000 pounds; yellow sugar made, 28,000,000 pounds; syrup made, 450,000 gallons; aggregate value of manufactures, $8,700,000.

Tanneries, 43—Men employed 335; horse-power of engines, 172; bark used annually, 5,000 cords; hides of all kinds, 360,000; aggregate value of manufactures, $1,700,000.

Tinware, tin box and can manufactories, 4—Men and boys employed, 180; value of manufactures, $525,000.

Type foundries, 3—Men and women employed, 35; aggregate value of manufactures, $34,500.

Vinegar manufactories, 2—Men employed 22; vinegar made annually, 1,600,000 gallons; aggregate value of manufactures, $255,000.

White lead factory, 1—Building 45x275, 4 stories, brick; men employed, 75; number of tons manufactured, 3,000; capital employed, $290,000.

Windmill manufactories, 2—Men employed, 16; mills made annually, 160; aggregate value of manufactures, $41,000.

Willow and woodenware and basket manufactory, 1—Men employed, 32; value of manufactures, $250,000.

Wine and beercask manufactory, 1—Men employed, 100; number of casks made annually, 3,000; value of manufactures, $200,000.

Wire and wire rope manufactory, 1—Men employed, 50; horse-power of engine, 125; amount of wire consumed annually, tons, 750; aggregate value of manufactures $360,000.

Woolen mills, 2—Men and women employed, 1,500; number of power looms, 162; cards, sets, 60; frames for knitting underwear, 28; frames for knitting hosiery, 24; spindles, 21; blankets made annually, pairs, 80,000; knit underwear, dozens, 6,000; hosiery, dozens, 25,000; wool used, pounds, 5,400,000; cloth and tweed, yards made, 600,000; flannels, yards, 1,600,000; aggregate value of manufactures, $1,900,000.

Carelessness in Mining and Assorting Ores.

On this subject, the *Black Range*, of Colorado, has this to say: Many mines, in prosecuting their business in this country, have paid too little attention to the formation known as talc. This substance is generally found in the neighborhood of mineral, and common custom has assigned it to the dump. That there are formations that carry mineral other than the general accepted ores is being proved so conclusively, that to say anything is barren is making an assertion that is likely to give the lie on test. Carbonates, in the early days of Leadville, were known to exist, but were supposed to be valueless, and hence the bonanza camp lay for years undeveloped and unthought of, other than for its placer mines. Tellurium is another metal, which, though unknown to experts, is not generally known at sight by most miners, and tons have been consigned to the dump because they could not see anything that looked like mineral in it. Recently at Bonanza, Colorado, some miners working a prospect were throwing this valuable mineral over the dump, and other parties coming along and seeing it bought the property for a fraction of what was in sight and on the dump. Lately the Nellie S. mine, on Printer Boy Hill, Leadville, has been consigning talc to the waste dump that on assay runs from $20,000 to $50,000 a ton in gold. The Palomas Chief has given us some magnificent specimens of native silver in talc, and now and then the Cuchillos are furnishing specimens that are plentifully specked with silver. To prospect thoroughly, formations lying adjacent to bodies of mineral should be assayed, and hearsay or common custom dispensed with. The fact that we cannot see mineral in rock is no evidence that it is not there, and more caution should be observed about rejecting mineral substances with which we are not well acquainted.

SMELTING AND LEACHING ORES IN COLORADO. At Golden, Colorado, the ore having been crushed by rock breaker and Cornish rolls, is dropped through shutes to the calcining department below. Ores which contain zinc, sulphur and antimony are roasted in the calciners, where the sulphur is expelled, after which the ores are removed to the smelting department, and there melted. The copper, gold and silver being the heaviest parts, sink to the bottom, and the slag, or worthless residue, remains on top and is skimmed off. The gold, silver and copper, or matte, which is obtained from the smelting, is then crushed until it will pass through a screen of eighty meshes to the square inch. The matte, which is now as fine as flour, is then taken to the refining furnace and again roasted. After this, it is ready for the leaching tubs; and here, to the stranger, is the interesting part of the works. In this room the silver is separated from the matte, and obtained in almost a pure state. The matte is placed in the leaching tubs through which hot water is running. The silver in the matte is now dissolved in the hot water, and the hot water, with the silver in solution, passes out of the tubs into silver cisterns. These cisterns contain several copper plates, and the water, with silver in solution, passing over them, loses the silver, it being precipitated upon the copper plates in the form of a sponge. The cisterns are cleansed once a week, the silver melted in a crucible, and then molded into bricks for shipment.

TOO MUCH OIL.—One day last week the east-bound overland train on the Central Pacific Railroad met with a singular delay between Verdi and Truckee. A freight train was immediately in front of the passenger train, and had among other cars one of oil, which leaked badly, flooding the rails with oil, and the overland train, when it reached the spot, came to a standstill. The sand boxes were opened, and it was with great difficulty that the train could be moved at all. Finally it was cut in two, and each part started separately. It took two hours to make a distance of five miles.

MECHANICAL PROGRESS.

The Needed Bran Compressor.

We referred, a few weeks since, to a reward for a bran compressor. We have since observed that the reports of the patent office begin to teem with bran packers, compressors or consolidators. Their inventors have a difficult problem, but nothing is impossible to modern mechanics; and we shall soon have, beyond a doubt, a practical machine for compressing bran into suitable shape for exportation.

In regard to the great commercial need for such a device, the *Northwestern Miller* informs us as follows: "Millers frequently say: 'I don't care anything about a bran compressing machine. I don't export anything, and can't see what benefit it will be to small millers," which shows the brevity of human vision. If the large mills do export their bran to Europe, the market at home will be left free for just so much more bran and offal from the smaller ones, and to that extent profitable milling will be increased. If enough bran is exported to close a hundred or a thousand European mills, (and many of them could not run, were it not for the ready sale of their offals at high prices) American mills will have just so much more to do. This is the reason why a bran compressing machine is needed by the whole trade, and why it will be just as beneficial to the millers who never see it as to those who buy it and use it.

Has it occurred to any of the inventors and advocates of bran compressing machines to figure on the probable gain through the use of such machinery? When they come to estimate it they will find the margin extremely small, unless the railroads experience a decided change of heart. At present, with an ordinary bran packer, it is easy to get 224 pounds of bran into a sack, ten such sacks making the ton of 2,240 pounds, which is the rule in Europe. In this form, rates of freight can be secured as low as on flour to the seaboard. Compressed bran can go at no better rate under present tariffs. On the ocean a difference of about seventy-five cents per ton can be obtained in favor of the compressed article. So at present we have this seventy-five cents on one side of the account, and the extra expense of compressing the bran (whatever it may be) on the other, with a good demand in existence for non-compressed bran on the one hand, and a prejudice against the compressed article on the other. We are not croaking, but are stating the facts just as they exist. To make bran compressing possible and profitable the railroads must discriminate in its favor, and the British and continental public must be educated up to its use. Here is good work for the National Association."

How Screws are Threaded.

We condense from a cotemporary as follows: Screw threads are generally originated in a lathe. All lathe turning with regular and constant feed is screw-cutting or threading. It is therefore evident, that with a proper speed, feed and tool, a screw thread would result.

Many screws are threaded by dies, which may be called hollow screws or nuts with cutting edges. These are sometimes worked by hand, often by power. The old-fashioned dies were adjustable so as to be "set up," and could be made to cut several sizes or diameters.

There is another method of cutting threads direct from the solid—by milling. The machine is entirely automatic, the blank to be cut being rotated as in a lathe, and a rotary milling tool rotating against it.

Threads on large screws are sometimes formed by being cast—a cast iron screw.

For some peculiar purposes threads are formed by simply twisting a square or flat bar—a common form of hand drill which has superseded the bow drill being a case in point. A familiar instance of a screw thread of this description is the ordinary auger or bit.

Another peculiar method of forming screw threads is that of raising a thread by rolling between dies, under pressure. Much of the "bright wire goods" in the market is made in this manner; the thread being generally formed by simply rolling—one revolution or a little more—the wire between two hardened steel plates.

The threads in nuts are produced either by the "originating" method, cutting them in a lathe as above described, by being tapped, or cast of soft metal, as brass; on a threaded core of hard metal as of iron or steel. But nuts are more generally made by tapping, running one two or three successive taps through them, either by hand or power.

Nuts of very thin material, as sheet brass for lamp tops, etc., are formed simply by rolling between spirally corrugated rolls—a work analogous to "beading" on tin ware.

NAILS IN THE DAYS OF OUR GRANDFATHERS.—There is scarcely any manufacturing process in which greater progress has been made, during the last century than in the production of nails, tacks and bolts. To obtain the supply of nails during the last century was, by no means, the easy problem that it is now, and many substitutions and make-shifts, such as wooden pins, bolts, clamps, riders, etc., were resorted to, to supply the inevitable deficiency. Says the *Age of Steel*, all nails were hammered out by hand at the anvil, and nothing like uniformity in weight or size was attempted. All were of wrought iron, and at best clumsily constructed, and, because of their softness, when one was once started the driver was never sure of its ultimate direction. Every hard substance turned them aside, and holes had to be bored for them in hard wood. Unavailing efforts were made to cast nails singly in molds, but from their brittleness they were found worthless. We have now at hand some nails that were made in England and brought to Virginia in the early part of the 18th century. Like all their prototypes, these are rudely shaped, generally sharp at the point, like a modern horse nail, thence rapidly getting thicker to the middle, whence they taper slightly to the head. The latter has in all cases been entirely disfigured by driving. They are all sizes, from half an inch to five inches in length, thick or thin, without regard to length, and bearing everywhere the imprints of the hammer. When we consider how long it must have taken the blacksmith to pound out a keg of these, we can form some slight conception of the advantages we enjoy from modern methods and appliances.

AMERICAN VS. ENGLISH NAILS.—The *London Iron Monger*, of a late date says that owing to indifference to brand on the part of English manufacturers and shippers there is a steadily growing demand for American nails, not only in the Australian Colonies, but in the markets of South and Central America. American nails, indeed, are now an important item of trade with the markets alluded to, and it is only in exceptional cases, or by the adoption of direct representation, that English makers of reputation are able to hold their own. The home demand was reported fairly good until the reduction declared a few years ago, which appears to have had the contrary effect to that intended, and buyers have since been holding off as if in doubt whether prices had really touched the bottom yet. In the export department the principal trade stirring of late has been with Australia, Chili, and the North of Europe.

SPIEGELEISEN.—But five companies in the United States make the peculiar kind of iron known as spiegeleisen: the New Jersey Zinc and Iron Company; the Cambria Iron Company, Johnstown, Pa.; Carnegie Brothers & Co., Limited, Pittsburg; the Briar Hill Iron and Coal Company, Youngstown, Ohio, and the Lehigh Zinc and Iron Company, Limited, Bethlehem, Northampton county, Pa. These five companies made only 21,963 net tons last year. Spiegeleisen is made in New Jersey, from a zinc ore, known as Franklinite. After the extraction of the zinc the residue is smelted to produce the spiegeleisen, which is a very peculiar white iron, valuable for steel-making from its high percentage of manganese—10 to 24 per cent. The original zinc ore is iron black in color, and leaves a brown streak.

A SAFETY VALVE should be large enough to discharge all the steam the boiler is capable of making. The following rule is that enforced by the United States Government in fixing the area of safety valves for the boilers of ocean and river vessels when the ordinary lever and weight safety valve is employed: When the common safety valve is employed, it shall have an area of not less than one square inch for each two feet of grate surface. The following rule has been prepared by Prof. Thurston: Multiply the pounds of coal burned per hour by 4, and divide this product by the steam pressure, to which the constant number 10 is added.

STEEL NAILS.—We mentioned some time since that the manufacture of nails from steel was to be commenced soon in Pennsylvania. The Harrisburg Nail Works' Co., have commenced the experiment and report that they have succeeded in producing a fine article. The nails are manufactured from steel made at the Pennsylvania Steel Works, the quality the same used in making rails; the nails are pronounced to be superior to the iron nail. They are nicely finished, and drive into the hardest of wood without bending.

LOCOMOTIVES FROM EUROPE.—So great is the demand upon the locomotive builders in this country, at the present time, that large orders have recently been sent to Europe, which could not be filled in season in this country. A large order has been received by Messrs. Nasymth & Co., of Lancashire, Eng., who will construct the engines ordered from American specifications after the strictly American type—it is said that all the locomotive makers in the United Kingdom are turning out only fourteen engines per month.

ROLLING LIQUID IRON.—To roll molten iron or steel in a liquid state, a rolling-mill has been proposed in which the rolls are to be cast hollow so as to receive a current of water, which will maintain a sufficiently low temperature. The metal is to run from a "hopper" or distributer and fall between the rolls, becoming cooled on contact with them. It is supposed that this method of rolling will have the effect of freeing the metal from any gases which it may contain.

STEEL NAILS are largely in use in England, and are said to be rising in favor, and some makers are doing rather a brisk trade in triangular and grooved nails, which are said to possess considerable strength and holding power relatively to their weight.

SCIENTIFIC PROGRESS.

Science and Progress.

It took the world many centuries to reach her present stage of intellectual development—the stage in which the highest intelligence and the best efforts of human activity are enlisted in the pursuit of science; but, having reached this stage, the wonder is, in view of the wholesome results that we are reaping from it, that the theologians and metaphysicians should so long have been able to exercise the dominating influence over the minds of men that history shows them to have done.

What the world owes to the creators of dogmas and architects of sects, let history tell. For nearly eighteen centuries they were the sole repositories of the learning (?) of Europe; the intellectual forces of the world centered in them and emanated from them. How they benefited mankind, how they advanced civilization, the pitiful pages of mediæval history record to their everlasting shame. Nor was this long period of darkness simply one of intellectual atrophy. It was an age of violent repression of everything that savored of independence of thought. Intellectual activity, unless indeed it was exercised in the direction of riveting still more strongly the fetters of mental bondage upon mankind, was a crime that was sure to bring down upon the irreverent actor condign punishment, for the thinkers and philosophers of those days were so fully taken up with matters relating to the future world, that they condemn man to intellectual slavery in this. Having the world entirely in their hands, they not only failed to advance it mentally, morally and physically, but they let and hindered those who might and could have done so.

Happily those times are past, and the world has entered upon a brighter epoch, in which freedom of thought is not esteemed to be a crime. What the coming centuries may have in store for the human race the future only will reveal; but if we may judge of the intellectual and material advancement of the twentieth century from that of the nineteenth, the coming man will be as far in advance of the man of to-day as the latter is in advance of the unwashed fanatic of the Middle Ages.—*Manufacturer and Builder.*

A Submarine Observatory.

If all that is stated in the following is reliable, the story of M. Jules Verne in his "Ten Thousand Leagues Under the Sea," may come nearer to being realized than has hitherto been dreamed of. A correspondent of an English technical journal writes to the effect that the forthcoming international exhibition of Nice is reserving some wonders for those who may propose to pass a portion of the winter of 1883–84 upon the borders of the Mediterranean. One of these wonders is a balloon which its inventor, M. Toselli, calls "the observatory under the sea." It is made of steel and bronze, to enable it to resist the pressure which the water produces at a depth of 120 meters. This observatory under the sea has a height of eight meters, and is divided into three compartments. The upper compartment is reserved for the commander, to enable him to direct and to watch the working of the observatory, and to give to the passengers the explanations necessary as to the depth of the descent, and what they will see in the depths of the sea. The second division, in the center of the machine, is comfortably furnished for passengers to the number of eight, who are placed so that they can see a long distance from the vessel or machine. They have under their feet a glass which enables them to examine at their ease the bottom of the sea, with its fishes, its plants and its rocks. The obscurity being almost complete at seventy meters of depth, the observatory will be provided with a powerful electric sun, which sheds light to a great distance in lighting these depths. The passengers have at their disposal a telephone, which allows them to converse with their friends who have stopped on the steamboat which transports the voyagers to such places as are known as the most curious in the neighborhood. They have also handy a telegraph machine. Beneath the passengers, the third compartment is reserved for the machine, which is said to be constructed on natural principles—that is to say, as the bladder of a fish, becoming heavier or lighter at command, so as to enable the machine to sink or rise, at the wish of the operator. If all that is stated is true respecting this wonderful "machine," we may well exclaim, What next?

Wine Ferments.

The researches initiated by M. Pasteur upon the alcoholic ferments, promise to have an important influence, not only upon beer brewing, but upon the apparently less artificially conducted process of fermentation that goes on in the production of wine. It seems quite probable that the quality of wine of any year is as much affected by the particular mold which predominates during the fermentation, as by the amount of sunshine or rain during the growth of the grapes, or even the passage of a comet through the sky. In Germany, it is already the practice to sterilize the must and then to sow it with some selected ferment, a process favorable to the elimination of various "false" ferments (species of *Dematii*) that are common to the surface of the grape and other fruit, while the custom in some southern countries of decanting the must as soon as the first foaming appears, may have the same effect. In a recent communication (*Comptes Rendus*, xcvi, 1,369) M. Le Bel incidentally remarks that last year none of the grape collection with which he had to do underwent fermentation influenced by what Pasteur considers to be the true wine ferment, (*Saccharomyces ellipsoideus*, Rees, but was all fermented by *S. Pastorianus*. M. Le Bel also states that a natural must yields a larger proportion of the higher alcohols than a solution of sugar fermented with the same ferment, and as the higher alcohols are more injurious to health than ordinary alcohol, it would appear that a beer made partly from sugar is quite as wholesome as one made solely from malt.

THE STORAGE BATTERY.—When the "storage battery" was so far improved as to win indorsement from Sir William Thompson, it was thought that by its aid the electric lamp would be rapidly introduced into dwellings; but the storage batteries can hardly be said to answer satisfactorily the expectations formed of them. Some experts claim that they have demonstrated by experiment that the storage battery as now constructed is too costly for practical use. The late discovery of this fact is because the cost of the battery is greatly increased by the serious deterioration it undergoes. If it were permanent, as it was at first supposed to be, it is not too costly; but if it depreciates at the rate of at least thirty per cent per annum, as is alleged, it is not commercially useful, except for limited kinds of work. On the other hand, it may be said that there is still hope of finding means to make the storage battery permanent and cheap enough for practical use. Sir William Thompson, out of several hundred batteries, has found one or two that unaccountably last without depreciation, while the others fail. It is the "unaccountable" in the successful batteries that remains to be discovered and applied to all. If one will work, all can be made to work, though it may require considerable research to find the conditions essential to success.

WHAT IS CARBON?—Mr. Berthelot, in the *Journal de Pharmacie et de Chimie*, treats of the elementary constitutions of carbon in a somewhat novel style. He says that from certain peculiar physical relations he is inclined to think that the true element of carbon is not yet known, and that it will eventually be found that graphite and diamond are not really identical, but are substances of a different order. M. Berthelot alleges that elementary carbon ought to be gaseous at ordinary temperatures, and that the various kinds of carbon which occur in nature are in reality polymerized products of the true element of carbon. Spectrum analysis is considered to confirm this view; for a spectrum recognized along with that of hydrogen in the light of comets is held to indicate a gaseous carbide, probably acetylene. If this hypothesis should be maintained by further research, it will be shown that the claim advanced on behalf of hydrogen to be considered as the fundamental element of the universe must be modified to embrace carbon. The spectrum in question is also shown by the Geissler tube.

RARELY in the history of science, says the *Lancet*, has a distinguished career equaled in its length that of M. Chevreul, whose name is best known in connection with his investigations on color; and it is probably altogether unique for a savant to be able, before one of the most distinguished scientific societies in the world, to refer to remarks which he made before the same society more than seventy years previously. Recently M. Chevreul made a communication to the Academie des Sciences, and at its close he observed: "Moreover, gentlemen, the observation is not a new one to me. I had the honor to mention it here, at the meeting of the Academie des Sciences, on the 10th of May, 1812!"

HUMAN HAIR UNDER THE MICROSCOPE.—E. B. Tylor, in *Nature*, says that the microscopic examination of the cross section of a single human hair is sufficient to determine to which one of the race divisions of humanity the wearer belongs. If examined microscopically by Pruner's method, it shows circular, or oval, or reniform. Its follicle curvature may be estimated by the average diameter of the curls as proposed by Moseley. Its coloring matter may be estimated by Sorby's method. There has been even a systematic classification of man published by Dr. W. Muller, of the Novara expedition, which is primarily arranged according to hair, in straight-haired races, curly-haired races, etc., with a secondary division according to language.

PHOTOGRAPHIC SPEECH.—Deaf-mutes are taught to speak and comprehend by watching the movements of the lips. According to the *Photographic News*, M. Wanerke has photographed the face of a man in which these movements were perfectly defined, so as to have the exact form corresponding to each sound. By means of these photographs inexperienced persons have been enabled to recognize the different articulations.

A NEW vegetable parasite, *Haplococcus reticulatus*, has been recently discovered in pork by Dr. Zopf. It occurs in from thirty to forty per cent of the animals examined. Would it not be well if we paid more attention to the sanitary legislation of Moses, a fragment of the ancient medical law of Egypt?

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Alta S M Co	Nevada	26	25	July 3	Aug 7	Aug 27	Wm. H. Watson	302 Montgomery st
Andes S M Co	Nevada	22	25	June 27	Aug 2	Aug 22	H Burris	309 Montgomery st
Argenta M Co	Nevada	16	25	June 21	July 24	Aug 17	E M Hall	327 Pine st
Albion Con M Co	Nevada	14	50	July 17	Aug 20	Sept 8	A W Havens	309 Montgomery st
Con Virginia M Co	Nevada	19	20	July 11	Aug 15	Sept 5	A W Havens	309 Montgomery st
California M Co	Nevada	8	20	June 26	Aug 4	Sept 3	C P Gordon	309 Montgomery st
Caledonia M Co	Nevada	39	20	June 15	July 19	Aug 9	R Wegener	414 California st
Excelsior D G M Co	California	22	40	June 16	July 23	Aug 10	T J Watt son	114 Davis st
Excelsior D G M Co	California	1	5.00	June 5	July 9	July 26	W. Cunningham	326 Montgomery st
Exchequer M Co	Nevada	19	20	June 14	July 19	Aug 9	C E Elliott	327 Pine st
Grand Prize M Co	Nevada	14	25	June 25	July 27	Aug 20	E M Hall	327 Pine st
Gould & Curry M Co	Nevada	45	50	June 15	July 20	Aug 13	A K Durbrow	309 Montgomery st
Holmes M Co	Nevada	7	30	June 27	July 30	Aug 21	C T Bridge	224 California st
Hale & Norcross M Co	Nevada	77	50	June 7	July 11	Aug 2	S F Lightner	309 Montgomery st
Justice M Co	Nevada	39	10	July 9	Aug 13	Sept 3	R E Kelly	419 California st
Mexican M Co	Nevada	23	50	July 17	Aug 22	Sept 11	C L McCoy	309 Montgomery st
Martin White M Co	Nevada	15	25	July 9	July 11	Aug 8	J J Scoville	309 Montgomery st
Savage M Co	Nevada	56	50	July 19	Aug 21	Sept 10	E B Holmes	309 Montgomery st
Tip Top M Co	Arizona	6	25	May 29	July 6	Aug 6	H Deas	309 Montgomery st
Union Con M Co	Nevada	25	50	July 17	Aug 21	Sept 11	J M Buffington	309 California st
Utah S M Co	Nevada	45	1.00	July 20	Aug 27	Sept 14	G C Pratt	309 Montgomery st
Virginia Con M Co	California	10	01	July 24	Sept 3	Sept 24	A F Benard	364 Howard st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Alexander M Co	Nevada	2	1.00	June 20	Aug 6	Aug 27	J K Warren	307 Montgomery st
Bald Mountain M Co	California	2	3	June 26	July 27	Aug 30	J Shannahan	125 First st
Champion M Co	California	12	10	June 4	July 34	Aug 11	T Wetzel	522 Montgomery st
Eintracht G M Co	California	2	05	June 12	July 7	Aug 3	H Kunz	209 Sansome st
Genesee M Co	California	1	40	June 20	July 30	Aug 22	J Stedtfeld	419 California st
Goodshaw M Co	California	14	10	June 6	July 14	Aug 4	C C Harvey	309 Montgomery st
Gorilla M Co	California	1	10	June 1	July 7	Aug 1	A A Enquist	436 Montgomery st
Hazard Gravel M Co	California	7	14	June 20	July 21	Aug 10	T McGeoghegan	318 Pine st
Homeward-bound M Co	California	1	25	July 23	Aug 27	Sept 10	A S Bowie	314 Montgomery st
Linna Con M Co	Arizona	6	05	June 11	July 18	Aug 6	R D Hopkins	436 Montgomery st
Pacific M & Reducing Co	California	1	25	June 20	July 25	Aug 15	J W Bevilng	413 California st
Pittsburg M Co	California	16	10	July 24	Aug 28	Sept 18	R Wegener	414 California st
Roma Union M Co	Nevada	2	02	June 18	Aug 6	Aug 27	F X Simon	518 Sansome st
West Branch Feather River M Co	Cal.	1	01	July 16	Aug 20	Sept 10	A B Paul	328 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Cumpion M Co	California	B Burris	309 Montgomery st	Annual	July 30
Derbec Blue Gravel M Co	California	Theo Wetzel	522 Montgomery st	Annual	Aug 9
Loreto Mill Co		H G Jones	327 Pine st	Annual	Aug 2
Mayflower Gravel M Co	California	J Morizio	328 Montgomery st	Annual	July 26
McMillian S M Co	Nevada	J Morizio	328 Montgomery st	Annual	Aug 1
Occidental M Co	Nevada	A K Durbrow	309 Montgomery st	Annual	Aug 13
New York Hill M Co	California	J B Leighton	527 Clay st	Annual	July 30
Red Hill Hydraulic M Co	California	E Hestres	328 Montgomery st	Annual	Aug 9

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Enlwer Con M Co	California	W Willis	309 Montgomery st	15	July 2
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	July 19
Navajo M Co	Nevada	J W Pew	310 Pine st	25	May 14
Silver King M Co	Arizona	J Nash	315 California st	25	July 12
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	June 12

Table of Highest and Lowest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING July 5.		WEEK ENDING July 12.		WEEK ENDING July 19.		WEEK ENDING July 26.	
Alpha	1.80	1.50	2 00	2.00	2.30	1.90	2.00	
Alta	.40	.45	.75	1.00	.65	.75	.60	.70
Andes	.45	.50	.45	.50	....	.45	.40	.75
Albion	....	.45	.40	.50	.35	.40	....	.35
Argenta	.10	.15	.05	.10	....	.05	.05	.50
Atlas	....	....	....	....	....	....	....	....
Belcher	1.15	1.15	1.25	1.20	1.25	.85	1.15	
Belding	....	....	....	....	....	....	....	....
Best & Belcher	4.05	4.20	4.25	4.45	4.15	4.40	4.00	4.30
Bullion	....	.75	....	.85	....	.85	.75	.80
Bechtel	....	....	....	....	....	....	....	....
Belle Isle	....	.50	....	.45	.35	.45	....	.35
Bodie Con	.80	.90	.60	.80	.60	.80	....	.65
Benton	....	....	.25	.15	.20	.15	.20	
Bodie Tunnel	....	....	....	....	.30	....	....	....
Caledonia	....	....	....	....	.25	....	....	.25
California	....	.10	.15	.10	.15	.05	.15	
Challenge	....	.30	....	....	....	....	....	.30
Chollar	3.00	3.85	3.30	3.75	3.35	3.80	3.50	3.85
Confidence	2.10	2.25	2.05	2.25	2.00	2.15	1.65	1.75
Con. Imperial	....	....	....	.10	....	....	....	.10
Con. Virginia	....	.45	.40	.50	.35	....	....	.40
Crown Point	1.25	1.30	1.40	1.45	1.30	1.45	.85	1.10
Day	.50	.55	....	.50	....	.50	....	.50
Elko Con	....	.25	....	....	....	.25	....	....
Eureka Con	4.10	5.00	4.75	6.00	4.50	5.00	4.75	5.00
Eureka Tunnel	....	.60	....	.60	....	....	....	.50
Exchequer	....	.25	.20	.25	.20	.50	.40	.50
Grand Prize	.05	.10	....	.05	....	.05	....	.05
Gould & Curry	2.25	.45	2.40	2.50	2.40	3.05	2.80	3 05
Hale & Norcross	6.00	7.00	5¾	6¾	6¾	6.75	7.00	
Holmes	....	....	....	....	....	....	....	....
Independence	....	....	....	.60	....	....	.50	.60
Julia	....	....	....	.15	....	....	....	....
Justice	....	....	.20	.25	....	....	....	....
Jackson	....	....	....	.35	....	.50	....	....
Kentuck	....	....	....	....	....	2.00	....	....
Martin White	....	....	....	.05	....	....	....	.25
Mono	....	....	....	....	....	....	2.80	2.95
Mexican	2 90	3.00	2.90	3.15	2.60	2.95	....	....
Mt. Diablo	....	....	4.50	6.00	5.00	5.50	....	5.50
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	....	....	....	....	....	....	....	....
Northern Belle	6¾	6.75	6¾	7.00	....	....	6.75	7.00
North Noonday	....	....	....	....	....	....	....	....
Navajo	2.90	3.20	2.40	3.20	2 85	3.10	3.05	3.40
North Belle Isle	....	....	....	.30	....	.35	....	.40
Occidental	....	1.25	....	....	....	1.50	....	1.75
Ophir	2.25	2.35	2.40	2.65	2.30	2.55	2.40	2.70
Overman	....	.30	....	.40	.30	.35	....	.35
Oro	....	....	....	....	....	....	....	....
Potosi	1.25	1.40	1.45	1.55	1.50	1.70	1.40	1.60
Final Con	....	....	....	.60	....	.65	....	....
Savage	1.95	2.10	1.95	2.05	2.10	2.45	2.25	2.40
Seg. Belcher	....	....	....	....	....	....	2.0	3.00
Sierra Nevada	3.55	3.80	3.90	4.45	3.65	4.10	3.80	4.35
Silver Hill	....	....	....	....	....	....	....	....
Silver King	....	.10	8.50	9.75	6¾	6¾	....	....
Scorpion	....	....	.60	.70	.55	.65	.60	.65
Tuscarora	....	....	....	....	....	....	....	....
Union Con	4.40	4.80	4.90	5 5	4.40	4.95	4.80	5 5
Utah	2.75	2.80	2.65	2.85	2.40	2.75	2.30	2.50
Ward	....	....	....	....	....	....	....	....
Wales	....	....	....	....	....	....	....	....
Yellow Jacket	3.65	3150	6.75	4.05	3.75	4 00	2.75	3.50

Sales at San Francisco Stock Exchange

THURSDAY A. M., July 26.

100	Alta	40c	
100	Andes	40c	
100	Alpha	1.90	
30	B & Belcher	4.15	
460	Chollar	3.30@3 55	
250	Crown Point	.90c	
200	California	10c	
225	Con. Imperial	.05@10c	
70	Confidence	1.60	
280	Eureka Con	.5	
125	Gould & Curry	2.80	
280	Hale & Nor	6¾	
220	Mexican	2.95@3	
185	Ophir	2¼@6¾	
100	Overman	.30c	
50	Potosi	1.15	
715	Savage	2.35@2.40	
100	Scopion	.60c	
150	Sierra Nevada	4 15	
400	Senator	.15c	
20	Silver King	6¾	
50	Utah	2.40	
250	Union	4.90	
210	Yellow Jacket	2.90	

AFTERNOON SESSION.

200	Albion	35c	
100	Belcher	85c	
600	Benton	15c	
500	Chollar	3.45	
50	Con. Virginia	35c	
230	Crown Point	85@90c	
110	Confidence	1.65	
400	California	05c	
310	Eureka Con	4.80@5	
150	Gould & Curry	2.80	
500	Grand Prize	05c	
150	Hale & Nor	6¾	
100	Martin White	25c	
245	Mexican	2.95	
50	Navajo	3.35	
530	Ophir	2.70@2	
550	Potosi	1	
200	Scorpion	65c	
40	Savage	2.30	
400	Senator	15c	
40	Sierra Nevada	4.15	
35	Union Con	4.85@4.90	

COLORADO, in the first six months of 1883, produced 226,947 tons of coal and 74,208 tons of coke.

Mining Share Market.

The volume of business in the stock market is small, and there is not much going on. The situation on the Comstock is unchanged, although close attention is paid to all news from there. The Standard mine of Bodie has paid a total of $84 per share in dividends, including the last one. The Benton Consolidated company at its annual meeting showed receipts for the year at $41,518, of which some $21,000 came from assessments. The Lady Washington company had receipts in the year of $9,921, of which $5,373 was from assessments, and $4,285 was a balance.

Bullion Shipments.

Horn Silver, July 20th, $9,000; Ontario, 20th, $4,318; Stormont, 21st, $2,021; Horn Silver, 21st, $12,000; Ontario, 21st, $4,548; Horn Silver, 24th, $24,000; Ontario, 24th, $9,014; Mt. Diablo, 19th, $6,124; Bodie, 23d, $3,140; Northern Belle, 19th, $6,029; Christy, 23d, $8,188; Standard, 23d, $14,306; Northern Belle, 23d, $5,973; Contention, 21st, $16,113. During the week ending July 21st, inclusive, there were shipped from Salt Lake thirty-six cars of bullion, 963,190 pounds; thirteen cars ore, 344,020 pounds, sent west; thirty-three cars ore, 603,000 pounds, sent to Colorado; making a grand total of eighty-two cars, aggregating 1,940,210 pounds.

LIGHTING THE ARIZONA MINES.—A number of mining companies in Arizona, says the *Citizen*, are about to adopt the electric light, to facilitate operations underground, as well as on the surface; among these are the Silver King Mining, the Howell Smelting, and the Conger Mill and Mining companies. At the Silver King mine it is proposed to use four 3,000 candle power Brush lights above ground and two below, together with twenty-five small incandescent lamps. The dynamo located near the main shaft will supply the current, descending 800 feet to the lower levels of the mine to the arc lights and storage boxes, from which latter the Swan lamps are to be connected by small copper wires. Fixed lamps are to be suspended from the roofs of galleries, and the portable lights are to be attached to flexible conductors for convenience of shifting. These lights are to burn continuously, night and day. In the reduction works of this company, both large and small lights are also to be used, a separate dynamo and two storage batteries supplying the current. The arc light circuit in this mine will be about half a mile in length.

A CHICAGO company is building machines for "consolidating" various waste products into compact blocks for use as fuel. Sawdust, shavings, etc., from saw and planing millsare pressed into molds so that 400 to 900 cubic feet of the loose material are compacted into less than forty cubic feet of blocks of convenient size and form to be used as fuel.

ON the French railroads the average number of employes per mile is far greater than on American lines. Some roads there average thirty-one, while the United States average is only five.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned

CALIFORNIA.

Amador.

PLYMOUTH.—Amador *Dispatch*, July 21: There is no mining being done outside of the Empire and Pacific mines, and probably won't be until time to work out the yearly hundred dollars and just hold the claim.

Butte.

CARPENTER'S FLAT.—Oroville *Mercury*, July 20: Capitalists are projecting a scheme, which, if carried into effect, will make Oroville one of the greatest mining centers in the world. That is the organization of a company to mine Carpenter's Flat to the bedrock. It is a well known fact that the entire flat is rich in mining ground, but as yet no adequate method has been employed to get rid of the water, which is encountered at a short distance from the surface. The new company propose to work it by means similar to those in operation in the silver mines on the Comstock lode. Powerful pumps are to be placed at different points, and it is believed that all the water can thus be got rid of. The working of this vast gold field will necessitate the employment of thousands of men. We are not at liberty to divulge the names of the projectors, but can state that they are gentlemen who are wealthy, and that their plans will be put in operation at no distant day.

MOORETOWN.—Rich. Dickenson, who resides a short distance east of Mooretown, brought to our office this morning some fine specimens of quartz taken from a ledge which crosses Sucker Run not far from his house. He represents the ledge as being fifty feet wide, and the specimens brought down by him as a fair sample of the entire ledge. The ledge crops out from both sides of Sucker Run, and thousands upon thousands of tons of rock can be obtained above the water level. There is splendid water power near for the driving of all machinery necessary for the working of the rock. He also brought a specimen of marble which was taken from a ledge on the creek, about half a mile above where the quartz ledge is found. This ledge of marble is about fifty feet wide, and where the creek cuts through it, it crops out to a height of seventy-five feet. Mr. T. W. Reece has taken specimens of both quartz and marble, and will send them to San Francisco for exhibition. A specimen of the marble will be sent to W. H. Plenire, Marysville, for testing.

INDIAN SPRING MINES.—Chico *Enterprise*: The managers of the Indian Spring mines, some five miles above Magalia, have recently been prospecting their cement, and find it to be rich beyond all anticipations. The tailings, even after being run through a second time, yield from $40 to $500 per ton. Mr. McLean says he can pick up at any time from twenty-five cents to four or five dollars from these old tailings. The discovery has caused quite an excitement, and a ten-stamp quartz mill is to be put in within sixty days. Very encouraging prospects, also, from the Red Hill mine, where an additional force of forty men will begin work in a few days.

Calaveras.

MURPHY'S.—San Andreas *Citizen*, July 21: The Oro Plata mill has started up with the new concentrators, five in number, with space for two additional ones if needed. The Frue Concentrators have been in use a number of years, and have given satisfaction wherever they have been in use. Mr. Miller is erecting a ten stamp mill on the Sunny Side mine, a property located in the Collier district near the celebrated Collier mine. Tom Goodwin, superintendent of the Calaveras mine, returned from the Bay last week. He speaks hopefully of the future of this mine. Supt. McNevin of the Washington mine is convalescing. The mine will soon be under his personal supervision.

Contra Costa.

EMPIRE COAL MINE.—Antioch *Ledger*, July 21: The Empire is better than ever. Last month they took out and shipped between 4,000 and 5,000 tons of coal, and expect to do the same this month. The coal is of first quality, it gives good satisfaction, and the demand for it is continually increasing. The mine is in excellent working order, with coal in sight enough to keep up the supply for years.

El Dorado.

GARDEN VALLEY.—Georgetown *Gazette*, July 21: The Rosekrans mine, has introduced an air compressor, and will hereafter use Burleigh drills. This mine is about three miles south of Georgetown. The Taylor mine near by, idle for so many years, is in the hands of men in San Francisco who have refused several offers for the property.

GREENWOOD.—The Morrell Con. M. Co.'s claim is now the center of attraction. In a drift run from the old tunnel splendid ore has been struck, and at a depth of 20 ft lower, from the new tunnel, the seam has also been found, showing a great improvement both in size of lode and quality of the ore, the gold brightly glittering in large blotches through the rock, which also shows fine gold in liberal quantities. In about 10 days the mill will be ready to operate.

Mono.

MOUNT CORY REDUCTION WORKS.—Bodie *Free Press*, July 21: Peter Huff, of Virginia city, has been awarded the contract to lay the foundations and perform other masonry work for the Mount Cory reduction works. He left Virginia on Friday for the scene of his labors. Mr. Huff tells the *Chronicle* that the quarry, which is situated about a mile and three-quarters from the mill site, is the finest in the State.

DETROIT COPPER WORKS.—C. H. West was out at the Detroit Copper company's works Thursday, and reports matters progressing very finely there. The company will make a shipment of a carload, or ten tons, of copper bullion on Sunday. The bars are from 250 to 500 pounds in weight. A specimen bar of 65 pounds was brought in by stage Friday.

BODIE VS. ARIZONA. The *Free Press* of the 20th inst. gives the experience of Mr. V. B. Cross, an enthusiastic Bodicite, who has just returned from New Mexico and Arizona, and who contrasts the prospects of these with those of Bodie in the following style: The most prolific thing in the country is the newspapers. These papers write up the mines and the country in the most extravagant and unblushing manner. They make a regular business of going around the country in droves of from a dozen to twenty-five reporters, writing up the mines that there is nothing in, and giving glowing descriptions of agricultural and grazing land that is so burned up that a jack rabbit would starve to death if turned loose on it. The country is full of "tenderfeet," who do not know a mine when they see it. The discovery of a hatful of ore will build up a town in a week. Mr. Cross engaged in frequent altercations with these ignorant people upon the subject of mines, and often informed them that if they had such a mine as the Standard of Bodie, they would get together a city of forty thousand people—which is a fact, in his opinion.

Nevada.

MAGENTA. Grass Valley *Union*, July 20: A meeting of the stockholders of the Magenta Consolidated was held on Wednesday evening for the purpose of increasing the capital stock from 20,000 to 100,000 shares. The vote in favor of the increase was unanimous, and it was voted that 20,000 shares should be set aside to be sold as a working capital, the price to be fixed at fifty cents per share. It was also decided to put up steam hoisting works on the mine. The Majenta adjoins the Empire company's ground, and is regarded as a property that will become very valuable. There is now a good working incline shaft on the claim to the depth of 350 feet.

MURCHIE.—Nevada *Transcript*, July 20: The Murchie is looking very well; turning out enough ore to keep the two mills (18 stamps in all) running right along. The Big Blue lead keeps up its reputation, while the Independence lead, which had been virtually abandoned when superintendent Tilley took charge, is improving. The mine is paying well now, and it is to be hoped that the days of assessments are passed, so far as it is concerned.

BANNER.—A crushing of 3,000 pounds of ore taken from the upraise on the 600 level north of the Banner mine paid $300, or at the rate of $200 a ton. There is more of the same kind yet in sight.

THE IRON MINE.—*Transcript*, July 6: Deputy Assessor Wheeler gives some interesting items about the iron mine 20 miles below Grass Valley. Using 80 bushels of coal to the ton of iron, the mine is now turning out 2½ tons of iron per day, and one day 30 tons were turned out of the furnace. Last year 185 bushels of coal were used to turn out one ton of iron. There are now 165 men employed about the mine. The mine is in a better condition than it has ever been, and wood-choppers and teamsters are in demand there.

Plumas.

QUINCY.—*National*, July 21: See & Jolly's mill has been running on good rock all the spring, and they are taking out some good ore now from the Specimen Ledge. Considerable mining has been done this spring and summer at Willow creek, and some good sized chunks taken out. The Spanish boys found a chispa weighing seven ounces, a short time ago, in their claim across Willow creek from Levasse's. Levasse has made a good spring's run. The Young California ledge on Mt. Ararat, below the Marlett channel, is paying very well. The owners work their rock in an arrastra. Quite a number of hydraulic claims are in full blast on the Middle fork, among them Jack DeLaps', and the boom of the water can be heard from the top of the mountain, two miles away.

Shasta.

FURNACEVILLE.—Redding *Free Press*, July 21: A correspondent says: Our mining interests here seem to be very favorable. Some excellent appearing bullion is being turned out under the management of Mr. Stewart, the superintendent, who appears to be well pleased with the prospects, and we may now consider the Afterthought works a success. Recently a fine body of ore was uncovered in the Peck mine, the assays of which are very good. Some other work is going on in the district. Various detentions have occurred, so that the mill has not been run continuously. The flume conveying water to the mill had been built for a number of years, and broke down in two or three places, but was soon repaired. Some of the machinery did not work well on the start, but everything is now going along right.

Sierra.

GIBSONVILLE. *Tribune*, July 19: Cox & Gurley have just wound up the season's work in their hydraulic mine; $30,000 was the amount cleaned up. The back channel of the Union drift mine is improving in extent and richness equal to the front channel, which was worked out in earlier years. The two owners of this mine recently divided $10,200 as the profit from two months' work with a force of 35 men. At the North American drift mine about 70 men are employed. Thirty of that number are taking out gravel. Until recently the whole force has been on dead work, such as running ahead tunnels and gangways. The mine is now in shape to take out gravel on a big scale and large returns may be looked for soon.

Siskiyou.

NOTES.—Yreka *Journal*, July 11: Siskiyou mountains are swarming with Chinamen in the vicinity of the tunnels and their approaches. The mining companies on Klamath river are full of business just now in sinking down large cuts to bed rock, with expectation of soon taking out an abundance of ore.

Trinity.

WEAVER BASIN.—*Journal*, July 21: Miners in Weaver basin are all done cleaning-up and say their claims paid as well as usual, considering the limited water supply. They will at once commence fixing up and get everything in good shape as all expect a big season next time.

EASTMAN GULCH.—The *Journal* says of a recent quartz discovery by "Uncle Jim" Blakemore, near Eastman gulch on the Trinity river: "It turns out much better than had been anticipated. Sixteen and one half tons of the rock ground in the arrastra produced $2,500, or at the rate of $150 to the ton, and the rock which they are now running is variously estimated at from $200 to $400 to the ton. The lode has well defined walls and widens and improves as they go down and in on it. Under these conditions it is not surprising that the Blakemores last week refused $50,000 for their mine, the offer being made by a justly celebrated quartz mining expert from San Francisco.

TRINITY MINES.—Oroville *Mercury*, July 20: Many of the miners have already cleaned up for the season. As nearly as can be learned at present, the gold yield will fall considerably short of what is con-

sidered an average season, but this is attributable to the exceeding dryness of last winter. For the quantity of gravel washed the yield is considered excellent.

NEVADA.

Washoe District.

MEXICAN.—*Enterprise*, July 21: On the 3100 level the main north drift is being pushed ahead rapidly to reach the line of the Union Con. and Sierra Nevada, where it will connect with the winze down from the 3000 level. The first part of next week sinking will be resumed in the joint Union Con. and Sierra winze below the 3000 level. The upraise from the 2900 level is being pushed to connect with the winze down from the 2700 level. From the 1900 down to the 2300 level the winzes joint with the Union Con. are being repaired.

UNION CON.: Are easing timbers in the joint Sierra Nevada drift on the 2500 level; also, doing the same work in the east drift on the 2700. The joint west crosscut on the 3000 level has penetrated the vein recently a distance of 40 ft. The face is all in material rich in gely composed of low grade quartz. Are repairing the joint Mexican winzes from the 1900 to the 2300 level.

SIERRA NEVADA: On the 3000 level the joint Union Con. west crosscut is cut 130 ft from the winze. It had yesterday been advanced into the vein recently cut a distance of 40 ft. North lateral drift No. 1, on the 2600 level, is being pushed ahead at the rate of about 20 ft per week.

OTHER: The repairs to the Central tunnel are progressing favorably, and the old Mexican shaft is fast being put in good order. The work of repairing the main incline track and putting in new ladders will soon be completed. The usual amount of ore is being extracted from the croppings.

HALE AND NORCROSS: It was expected yesterday afternoon that the connection would be made between the 2400 and 2600 levels in an hour or two.

ALTA: A drain is being made in the drift connecting with the Sutro tunnel, a pump tank is being constructed at the 1030 level, and all is being put in order for pumping out the lower levels.

BEST AND BELCHER: The joint Gould and Curry east drift on the 2500 level is in a soft vein material, containing frequent streaks of quartz and clay. The northwest drift on the same level is making about 30 ft per week.

GOULD AND CURRY: The joint Best and Belcher east drift on the 2500 level was advanced over 30 ft during the week.

UTAH: The drift from the upraise is completed, and the pipes for carrying the water to the Sutro tunnel are being put in.

CALIFORNIA: The tank station at the 2800 level in the C. and C. winze is nearly completed. On the 2900 level the south drift is progressing at the rate of about 25 ft per week.

ANDES: The west drift is being advanced at the rate of about 10 ft per week. The winze is in low grade ore and quartz of a fine appearance.

YELLOW JACKET: The yield of 150 tons per day is kept up, and at the same time a good deal of exploring work is being carried on at various points.

CON. VIRGINIA: The tank station in the C. and C. winze at the 2800 level is about completed.

SAVAGE: Prospecting will soon be commenced on the 2600 level, where there is a large amount of ground ready for crosscutting.

BELCHER: A considerable amount of low grade ore is being extracted and sent to the mills.

Belmont District.

WILLOW CREEK.—Winnemucca *Silver State*, July 21: B. H. Luther, who visited the Willow Creek mines a few days ago, says there is considerable prospecting going on in the camp. The Choate boys are sinking on their ledge and have a very fine prospect. The Penobscot Boy, owned by McPhetres & Co., appears to be the largest gold-bearing quartz vein ever found on the coast. Cuts have been run across the lead on the surface in several places, and free gold in paying quantities is found everywhere. The lead runs through a smooth, grass covered hill, and the open cuts are run through grass a foot high, the quartz being from three to six feet below the surface.

BELMONT ORES.—The *Courier* says: The Belmont Mining Company's mill was running last week for the purpose of ascertaining which of the two processes, "amalgamating" or "leaching" is the best and cheapest, and following is the result of the test: By the amalgamating process, bullion produced, 847 ounces; 441 fine; assay value, $477.27. By the leaching process, bullion produced, 530 ounces; 925 fine; assay value, $633.88.

Columbus District.

NORTHERN BELLE.—*True Fissure*, July 21: The southwest drift on the fifth shaft level has been extended 9 feet during the week; the total length run is 159 feet. The formation has changed very materially, the face of the drift looking very favorable for encountering ore. In the crosscut to the south, on the same level, there has been no work done. The stopes on the fourth shaft level are yielding as usual. The stopes look well in the upraise above the first shaft level, and are showing an improvement. The section of the mine above the adit levels presents very much the same appearance as last week, except the seventh level, where the ore improves as the work on it progresses upward. Some fair grade ore is being taken from the ninth level, also from the winze from the eleventh. The daily yield of ore has been about 53 tons, which is being shipped to the mill. Both mills are running steadily and doing good work. The bullion shipments have been $12,550.23 for the week ending July 19th, and aggregate $37,076.70 on July account to the same date.

MOUNT DIABLO.—The stope below the third level, near winze No. 1, is yielding a small amount of $50 ore. The stope west of winze No. 2 is not looking so well, but is turning out considerable $50 ore. The stope below the third level, near the head of winze No. 2 is showing some two feet of ore assaying $75 per ton. The stope above the third level near the same winze, does not show anything of value. A number of car loads of $150 ore have been taken from a bunch below the third level, near winze No. 4, during the week. A crosscut has been run 30 feet north from the winze between the second and third levels. It is nearly north from the shaft, and has cut a ledge of $60 quartz that looks promising. The intermediate stope, between the second and third levels, nearly above winze No. 1, is giving a small amount of rich chloride, and a crosscut has been run some 40 feet to the north from the second level above this stope. It has cut the ledge, which is a narrow streak of $200 ore, at this point. The stope above the west drift from the Callison winze is not looking so well in the center, the ledge being narrower. The east end shows rather a stronger ledge. A great deal of $100 ore is being extracted from this stope. A shipment of bullion valued at $7,633 was made on the 12th instant, and another of $9,484.71 on the 16th.

BORAX.—G. L. Turner & Co. have commenced the manufacture of borax, meeting encouraging success, the first tank yielding 800 pounds of fine borax. The company has 120 acres of land, and expects to produce about ten tons of borax per month, worth about $1,600. Goodwin & Roach are erecting six tanks, and intend to add six more as soon as practicable. They have 400 acres of ground and will manufacture a ton a day when the twelve tanks are in running order. Mr. Roach has had great experience in the business, having been in charge of the works at Teal's marsh for several years. Schwartz & Mohni are working a large pile of tailings, originally from Teal's marsh, and are attaining satisfactory results. These tailings were worked some ten years ago, being hauled some fifteen miles for that purpose. Marrotte & Co. are also about to erect works on their claim of some 200 acres. Other parties have located ground and will probably erect tanks and boilers.

DAYTON. *Times*.—Garfield and Santa Fe contain some of the best mines in the State, some of those in Garfield having paid their way from the surface. Farther south, along the White mountains, are large mineral belts containing innumerable ledges, from which poor but energetic miners can make good profit from their labor. Sampling mills will soon be built at two, and perhaps three points, and a great deal of money will come from the districts within reasonable reaching distance. Since it has become easier for the prospector to get supplies, new districts are being made, which will soon add their valuable output to the wealth and industry of this section. In Deep Spring Valley, within a short time, developments have been made which leave no doubt as to the great value of the district. Darwin, Cerro Gordo and Beveridge, formerly noted districts, are again becoming centers of industry and are receiving much attention from Arizona mining men. This is a country of old time miners, who knowing the value of their property have staid for years, sometimes in distress, and nearly always in straightened circumstances. They are now to be rewarded for their faith and patience, as facilities for transportation and cheaper methods of working rock will permit them to derive an income from what has been heretofore almost dead property.

Pioche District.

MEADOW VALLEY.—*Record*, July 14: The two men working on the tunnel level have sunk on the ledge some 10 ft and extracted ore along it for a distance of 20 ft. The ore continues improving, that being extracted will pulp $75 per ton. It is likely that at no distant day the company will have a good force of men working on the old ledge that was abandoned in early days owing to the low grade of the ore. The mills have all run out of salt, and there is none to be had in this vicinity at present. The mill at the lower end of town has been closed down for want of the article. There is a wagon train loaded with salt on the road, which is due, and liable to arrive at any moment.

KINGFISHER.—At every blow of the pick this mine in Jackrabbit district, improves. The dead work having been done, the miners are engaged sinking the shaft. In the ledge a three-ft vein of dark-red ore was encountered the first of the week, and looks like free milling ore. It assays $96.25 in silver. The Kingfisher presents one of the finest prospects in southern Nevada. The ground is exceedingly favorable for the opening of a big mine at any moment.

DAY MINE.—The work of developing the ore bodies in the lower workings of this mine is being pushed ahead as rapidly as circumstances will permit. The ore chambers look very favorable as far as penetrated and create great hopes in the minds of all who have seen them.

AT BULLIONVILLE.—The concentrating tables were started here running on the night of the 7th inst. They have been placed in excellent order and are doing good work. The average yield per day of the mill working tailings is about $140, much better than was expected. There were two bars cast at the mill on Sunday, and another 90-pound bar yesterday. As soon as the smelting company have completed working the old tailings they will be enabled to rework the tailings that have already been run through by a new process. So they believe.

ARIZONA.

ABOUT PINAL CITY.—Pinal *Drill*, July 14: On the Nacoochia, they are timbering the shaft preparatory to sinking. The South Pioneer has 7 ft of pay ore in the north drift, 300 level. Twenty-one men at work in the mine. The mill is run steadily. Santos Corona is building and adobe smelting furnace and refinery in connection with the Queen creek water jacket. The late rains have caused a plentiful supply of water and a few days now will suffice to start the Queen creek smelter. The Hastings Co. are working a force of men. The Surpriser is under the management of J. H. McMullen. The Eureka mine is constantly improving. The walls are prominent. The hanging wall is very smooth, the foot wall coarse. The supply of ore is increasing and more than the mill can consume. It shows large quantities of horn silver. Sinking and drifting on the Monarch of the sea. At the bottom of the shaft, ore assaying $5,300 has been found. They have now 20 men employed and are preparing for operations on a grand scale. The owners have worked cautiously hitherto and the present increase is a good sign. Rain has fallen in many parts of the Territory, the fall in most places has as yet been light, 75 tons of bullion were lately shipped by ox teams from the Howell reduction works to the A. & P. railroad. These works are on Lynx creek, about 12 miles southeast of Prescott. One hundred men are employed in the underground workings of the Silver King mine. Old Dominion shipped for the week, 71 bars—22,840 pounds. Total, 3,588,275 pounds. On hand and waiting shipment, 318 tons. At Pine Springs, Gavin & Co. have a large lot of horn silver sacked ready for shipment, and up to date the mine holds its richness and has widened. It the north drift horn silver 88% pure has recently been taken out. The Globe Silver Belt has 7 ft of pay ore in the north drift on the 300 level. There are 21 men at work in the mine. The mill is working steadily. The Callen mill at Walnut Grove is running on full time and bullion is streaming out.

PRESCOTT. *Courier*, July 3: The Black Warrior mill continues to work out silver bullion. The Peck hoisting works are up. J. N. Rodenburg exhibits very rich silver ore just received from Turkey creek district. It was sent him by B. T. Shaw, who took it from an extension of the Pine Spring mine. The Pine Spring mine, owned by Messrs. Gavin, Roberts and Morgan, continues to yield very much rich ore. Joe Taylor, just from the Silver Belt mine, says that never before has it been in as healthy a condition. C. T. Lewis tells us that the Castle creek smelter will be running in a short time. Geo. Monroe has discovered a big thing in lead, near Wickenburg. The Howell reduction works are going. The company will shortly ship upwards of 70 tons of bullion. Boxes of ores are every day going forward to Denver and Santa Fe.

NOTES. Prescott *Courier*, July 20: Gentlemen just from the Belle mine belonging to the Howell Co., tell us that ore is being raised from a depth of 325 ft and that the mine is in fine condition. Guilford Hathaway tells us that a shipment of 35,000 pounds of bullion was made from the Howell smelter two days ago. The mill will soon be up and running.

HACKBERRY.—Mineral Park *Miner*, July 15: There are thirty-seven men employed in the Hackberry mine at present, besides seventeen in the mill. Fred. Nobman is sinking for water, in order to have enough to keep the mill running. The mine is looking well everywhere, and is being opened up in every direction under the management of F. N. Johnson. The report that M. Abernethy was about to resign his position as superintendent of the Indian Queen company is untrue. I. J. Sands is working in the mill.

EL DORADO CANYON.—The Southwestern mining company have a fifteen-stamp mill, dry crushing, with cylinder roaster attached. This mill was kept running last year for eight months on ore from the Savage and Techateiomp mines, which belong to the company. These mines have produced some half million dollars in bullion since being located. The mill was started up in April of this year, and has been running regularly ever since. The five-stamp mill belonging to the Lincoln silver mining company at the Canyon, has been running on custom ore, with good results. The Southwestern mining company have about forty men employed at present. Many miners are at work about El Dorado Canyon on their own mines, and many others chloriding on the mines owned by Gillispie, Lund & Co. The intense heat of summer prevents many mines being worked at the Canyon at this season, but none of them remain idle during the winter.

COLORADO.

IDAHO SPRINGS.—*Gazette*, July 14: Some of the finest mineral land in the State is open to projectors in Ute and Cascade creeks. Solid silver glance weighing as much as three ounces is being found in float at the head of Cascade gulch, and quartz carrying sulphurets of silver that will assay $900 can be picked up at the head of Ute creek. The finest timber in the State is here to be seen and the water is as pure as any in the world. Work is being vigorously pushed on the Silver Link lode near the entrance of Ute creek. The mineral contains galena, gray copper, and rosin zinc, and very much resembles the ore of the Eclipse mine. Prospectors are arriving daily at Bullion Camp from all quarters. Work is progressing finely on the Treasurer and Twin lodes on Ute creek. Elliott's placer claim is being successfully worked on Chicago creek. Three men are being worked on Treasury Vault lode, Cascade gulch. A large body of ore has been struck in the Silver King mine, Cascade mining district. Work will commence on Denmark lode, Bullion camp immediately. The Kitty Clyde mine presents a handsome appearance with its many new improvements. The plant of machinery for this mine was successfully taken in on Monday last. Ten and a half tons of second and third class ore were shipped to Black Hawk from the Silver Glance mine on Saturday last. Mr. Fallon is working his Royal Oak group of mines on Ute creek, and obtaining a very fine grade of mineral. Mr. Finch manager of the Wallace mine in Bullion camp, is working that property day and night. A good graded road is nearly completed from the mine to the Spring gulch road. Work is steadily being proceeded with on the Golden Eagle lode at the head of Maxmillian gulch. The vein is six ft between walls, and carries a pay streak of 10 inches mineralized quartz on the hanging wall that mills two ounces gold and ten ounces silver per ton.

IDAHO.

SMOKY MINING ITEMS.—Ketchum *Keystone*, July 21: The placer mines of Little Smoky are being worked to advantage, and a wagon road is being constructed to them from Camas Prairie.

THE FOURTH OF JULY.—One of the first discoveries in the Smoky country, shows large quantities of high grade ore and bids fair to develop into a rich mine.

THE ALTURAS. Is being opened up by Messrs. Whitmer & Dithmer. It is a well defined ledge, and carries, in addition to good galena, some specimens of gray copper.

THE CLIMAX.—It is being worked by a lively crew, and report says is the scene of a recent big strike, a large body of galena having been disclosed, and now considerable ore is being extracted.

THE CARRIE LEONARD.—This mine has shipped upwards of 60 tons of 180 ounce ore, but, until a wagon road is constructed to the mine or reduction works established on the Smoky it is nonsense to take out the ore from the drifts.

ABOUT KETCHUM.—It is estimated that the timber on the mountains about Ketchum is sufficient to supply the Wood river country for 25 years to come, and the supply on all tributaries to the upper Wood river is exhaustless. Some beautiful specimens of float galena ore brought in by Trail creek prospectors and the discovered ledges in that locality show flattering indications. It is rumored that an immense galena discovery has recently been made on the East Fork of the Salmon. It is said that the lucky strike consists of 15 ft square, as far as uncovered, of solid galena.

LIVELY AT ALANTA.—Atlanta is enjoying quite a boom in a small way. There are probably 200 men at work in town and in the immediate vicinity, two mills of 20 stamps each are going up and a good deal of building is going on. The Monarch mine is showing up splendidly. From the surface to the 200 level this mine yielded $1,400,000 of first-class ore, 1,000 tons of which sold in Omaha for $1,000 per ton. At present, in addition to the low grade ore reserves in the upper levels, there is a large body of ore in the lower levels.

BIG MINE.—Hailey *Times*, July 14: A ledge near Vienna, over which a trail has been traveled three years without anything being found until recently, has developed into a bonanza. Mr. Childs, having noticed the ore on the surface, which by everyone else was regarded as float, took a careful look at it and found it to be ore in place, and set a gang of miners at work upon it. A few days since there was opened up here a lode 35 ft across, all ore assaying into the hundreds. This is the biggest ore showing on the surface found anywhere since the Custer mine was discovered.

MONTANA.

THE LEXINGTON. Butte *Inter-Mountain*, July 18. The affairs of the Lexington Co. continue in the same satisfactory condition that has characterized them since the present management took hold of the enterprise. An inquiry as to the workings of the mine and the outlook of the property was met by a courteous invitation from Manager Medhurst to let the product of the mine for the past six months speak. In compliance with his suggestion the *Inter-Mountain* is enabled to state that on July 1st a dividend of 1,100,000 francs was paid in Paris to the stockholders. The product of this property from January 1st to July 1st, 1883, was $638,548; which would betoken that the Lexington Co. have a valuable hole in the ground, and that Butte is not quite dead yet. Two salt batteries of five stamps each have been erected in the mill, one of which was started up a few days ago, and the other will be set in motion probably before the end of the week. R. W. Noble brought 96 ounces of gold into Virginia City last week, the product of a run of ore from a mine on Wisconsin creek in which he is interested. Placer diggings have been discovered with in a short distance of Billings and several claims are already located. It is said to be pay dirt. About 10 tons of ore per day are now taken out of Clark's fraction by only six men. Assays of the rock show it to carry between 60 and 70 ounces of silver.

NEW MEXICO.

KINGSTON. *Tribune*, July 12th: The two smelters at Copper City will blow in soon. All the White Oaks mines are reported as producing finely. The rich ore in the Bear mountain mines still holds out. The Old Man mine, Bear mountain, has been surveyed for a patent. The Southwestern M. Co., of Topeka, will erect machinery at their mines near Chloride. The Myrtle mine, Central City district, is looking exceedingly well for the amount of work done. The Cariboo mine at Fleming is now developed by an 80-ft shaft and is producing high grade ore. The ore produced by the Silver Bear mine, Mogollon mountains, is becoming richer as depth is attained. Two hundred sacks of ore weighing 10 tons have been shipped from the Silver Monument mine, near Chloride, to the Argo works at Denver. A five ft breast of rich ore has been struck in the Last Chance mine at Pyramid. This mine makes a regular shipment of a carload of ore per day. The mines of the Sandias are reported showing up splendidly. The Bullion mine at Kingston is looking better than ever and high grade silver ore is being extracted. It is reported that a force of of 20 men are at work, night and day, on the Little Mac mine, White Oaks district, and are taking out a large amount of high grade ore. The work of surveying the Buffom mine, Chloride district, for a patent, was completed last week, and work has been resumed in the shaft. The opening is now 227 ft deep, and is nicely timbered from top to bottom. The vein shows an ore streak of solid metal that runs $225 in silver and $50 in copper.

OREGON.

COPPER KING.—*Oregonian*, July 20: The Copper King copper mine of Baker county, is to be developed by Captain Hoatsen, late of the Lake Superior mines. He has gone over the claims and reports them of great value providing the veins run true. Lake Superior mining parties agree to pay $100,000 for a fifth interest in case the mines promise as well on later investigation.

ELLENSBURG.—*Localizer*: We saw a nice sample of what is said to be genuine anthracite coal. Upon inquiring we learned that the discovery was made by Wm. Packwood; that it is located on the west slope of the Cascade mountains in the Packwood pass, and that it is 18 to 23 ft wide and many acres in extent. We believe this is the first discovery of that particular kind of coal in the Territory.

UTAH.

PARK CITY.—Salt Lake *Tribune*, July 20: A piece of galena and carbonate ore weighing 400 lbs. has been taken from one of the mines at this place. In Thayne's canyon, there is unusual activity in building improvements and prospecting. The Council Bluffs Company, is now engaged in getting out timber for a boarding house, and from present indications the company is liable to continue work on their mines through the winter.

COPPER GULCH.—J. M. Burke and others are developing the Creedmoor, Magnolia and Gallanipper, near Frisco. Sixteen men are employed, one-half being on the Creedmoor. In this property a good vein of ore was struck, which, in places, is six feet wide, the ore going 60 per cent lead, and 20 ounces silver. At present the head of the drift is in a fault or barren ground, but it is hoped soon to find the body of ore. Frisco is a very quiet town just now, while matters at Copper Gulch are more lively. The Cactus Company made a test run yesterday of their concentrators, which promises to prove successful. The Cactus has an immense ore body, and if this can be concentrated and worked cheaply, Copper Gulch will soon become a lively camp. A large force of men are employed putting up boarding houses and other buildings around the Cactus and Comet mines.

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SAN FRANCISCO:
Saturday Morning, July 28, 1883.

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Passing Events.

The mining situation in different parts of the country seems to be very favorable, judging from the reports in the local press. In nearly all sections developments are being pushed ahead with confidence. Prospectors are busy at their summer's work, and though we have heard of no wonderful strikes this season, or the establishment of new and important districts, yet many new mines have been found.

We note elsewhere the preparations for the establishment at the local rolling mills of extensive steel works, which is an important industrial advance on this coast.

The telegraphers' strike is the topic of the town, and thus far it still continues.

Extensive preparations are being made throughout the city for the reception of many visitors to the Triennial Conclave next month. It may be that some of these visitors will take more or less interest in our mining industry, and visit our mining regions.

LEADVILLE has now six smelters, whose combined capacity is 775 tons of ore a day. It has also two stamp mills of a capacity of 80 stamps. Over 800 tons of ore per day are thus used in Leadville, while about 450 tons are shipped to other points. The total output for the year 1882 of the Leadville district was $17,181,853, and it is expected that the yield of the present year will be still greater.

THE Lake Superior (Mich) mines report a product of 2,648 tons copper for June.

End Lines of Mining Claims.

No more perplexing questions ever arise in mining litigation than those connected with "end lines." Section 2320 of the Revised Statutes provides that "end lines of each claim shall be parallel to each other." This seems a very simple proposition, yet many unforseen difficulties have arisen, which would occupy too much space to detail, but to which we have before referred, as the circumstances arose. Now, however, comes the Secretary of the Interior, and declares that the statutory direction that the end lines of a lode claim must be parallel, should be followed, as a rule, *but*, under certain peculiar circumstances, an exception to the rule may be allowed. If this ruling had been in existence some time since it would have saved endless trouble.

Some consideration of this subject will be of interest to all miners. It will be remembered in the case in the United States Circuit Court, District of Nevada, of the Eureka Consolidated Mining Co. vs. the Richmond Mining Co., objection was made to the validity of certain patents, because of non-compliance with the provision aforesaid. It was, however, held that "the provision of the statute of 1872 (incorporated into Sec. 2320 aforesaid), requiring the lines of each claim to be parallel to each other, is merely directory, and no consequence is attached to a deviation from its direction."

It was further held that "the defect alleged did not concern the defendant, and no one but the Government had a right to complain."

In reviewing the case, on appeal to the Supreme Court, the question as to whether the statute was directory only, does not seem to have been specially considered. The patents were, however, construed; and the court said: "Upon the face of the patents the United States has granted to the Eureka the right to all veins, lodes, and deposits, the tops or apexes of which lie on the inside of its surveys as patented, throughout their entire depth, and wherever they may go, provided it keeps itself within the end lines of the survey. The finding that the ground in dispute is within the end lines, and that the apex is within the surface lines settles the rights of parties between themselves as well under their patents as under their compromise agreement."

The case which brought forward the ruling of the Secretary of the Interior to which we are referring was one arising in New Mexico. It seems the Commissioner of the General Land Office directed the Surveyor-General of that Territory to amend a survey of a mining claim because "the broken and parallel end lines of the claims aforesaid do not afford a substantial compliance with the law." The matter was brought before the Secretary of the Interior, who made the ruling referred to.

It should be stated why the Secretary made an exception in this case. Although in the case of the Eureka Consolidated vs. the Richmond Consolidated mining companies the statute was held by the Circuit court to be directory only, and the ruling was not disaffirmed on appeal, the Secretary thinks that the statutory question should, as a rule, be followed; and he approves fully of the Land Commissioner's practice of requiring surveys to conform to the direction. The reasons he gives for making the exception in this instance are as follows:

There are no conflicting interests, and the question is one between the claimants and the government.

The facts show that the claims are located in a section of the country subject to Indian depredations. Two surveys have already been made, at great expense and under great difficulties, guards being required to protect the surveyors from hostile Indians. The last survey has been approved by the Surveyor General, and it seems to be correct in all respects except as to the broken parallel end lines. It is also reported that the peculiar topography of the country required these variations to enable a proper survey of the claim to be made. A further survey would now be attended with even greater expense and more hazard, on account of the renewed violence of the unfriendly Indians.

The interests of the claimant, who has already been put to large expense, and who seems to have acted in the utmost good faith, seem to require speedy action in order to protect him from loss.

Under these peculiar circumstances, the Secretary of the Interior directed the Commissioner of the General Land Office to approve the survey submitted, notwithstanding the fact that the end lines were not shown to be parallel.

Ores of Nickel.

Of the ores of nickel, the most important and those from which the nickel of commerce is is largely obtained, are kupfernickel and nickel speiss, while the other more important of its ores are nickeliferous pyrites, nickel glance, arsenical nickel, etc. The ores of nickel occur in most parts of the world where other metalliferous deposits exist in more or less small quantities, but the most abundant supplies are found chiefly in Norway, Sweden, Hungary and South America.

Kupfernickel—false copper or copper nickel—is an arsenide of nickel constituting the principal ore of the metal. It occurs as a copper-red, opaque, brittle body, sometimes crystallized in hexagonal forms; at others, in massive reniform, columnar or arborescent forms. Its specific gravity varies between 7.3 and 7.5, and its hardness is 5.5. Its streak is pale brownish red; it exhibits a metallic luster, and exhibits a gray or blackish color when tarnished.

Analyses of this mineral show it to contain from 35 to 45 per cent of nickel, the residue being chiefly arsenic, with only small proportions of sulphur, iron, etc., but occasionally antimony is present in not inconsiderable amount. This mineral occurs in Bohemia, Thuringia, Hesse, Styria, Saxony, Norway, Westphalia, Hungary, France, Cornwall, Connecticut, etc., usually associated with ores of cobalt, copper or silver; and occurring in gneiss, mica slate, clay slate, quartz, syenite, etc. Other arsenides of nickel occurring native are Cloanthite, Rammelsbergite, etc.

Nickeliferous pyrites, or capillary pyrites, is a native sulphide of nickel, which occurs in a brassy yellow, brittle, opaque solid, having a metallic luster, with a hardness of from 3 to 3.5, and often occurring in rhombohedral crystals, although most frequently occurring in strings or threads, along with other minerals. It is found in Bohemia, Przibram, Andresberg, Cornwall, and in Pennsylvania.

Nickel glance is a silver white or steel gray brittle mineral with a metallic luster, a grayish black streak, and a hardness of 5 to 5.5. It occurs massive, or crystalized, in monometric or cubic forms. It varies much in composition, but contains usually from twenty-five to thirty per cent of nickel, with from forty to forty-five per cent of arsenic, and from fifteen to twenty per cent of sulphur, while other varieties contain from forty to fifty per cent of antimony, and smaller proportions of arsenic. It occurs in Sweden, Westphalia, Thuringia, Hartz, Styria, Hungary, etc. Amongst other minerals containing nickel in large proportion may be noted millerite, a native nickelous sulphide; emerald nickel, a native nickelous hydrocarbonate; annabergite, or nickel bloom, is an arseniate of nickel.

Locating too Much Surface Ground.

When a man locates a lode mining claim under the United States mining laws, he is allowed to take up 1,500 feet along the vein and 300 feet on each side. His location is, therefore, 1,500 by 300 feet. To this he is entitled. A man may take up more on each side than he is entitled to, by mistake, or mismeasurement, but he cannot hold it if the mistake is discovered, and others may lawfully locate the excess as side-ground to other lodes. A ruling has just been made by the Secretary of the Interior to the effect that the taking up of more width of surface ground for a mining claim than is allowed by law does not invalidate the location, and the monument stakes may be moved to cast off the excess.

This was in the case of a mine in Tombstone, Arizona, where one of the objections raised to granting the patent was that the original location was found by the examination preliminary to survey on the ground to be more than 600 feet in width, and the claim was so reduced as to cast off the excess.

The Secretary says: "It can scarcely be seriously urged that such a correction of lines to bring them within legal restrictions should be held to invalidate the original location, any more than a settlement claim of pre-emption could be held invalid because by mistake the settler at the first had mistakenly embraced in his filing a larger area than 160 acres. The rule has always prevailed to the effect that he may reduce his claim by proper amendment to include the legal area. So, also, of homestead entries"

Blowpipe Lead Assay.

Lead is extracted from its matrix by fusing the finely powdered mineral with metallic iron and a fluxing and reducing agent in a small crucible placed in the charcoal melting furnace. The earthy matters and non-reducible oxides and sulphides are slagged off, and a button of metallic lead will be formed in the bottom of the crucible. The assay of lead by fire is always attended with a heavy loss, as lead volatilizes readily when strongly heated, and portions are also liable to be carried off in the slag.

Fire assays of lead ores, when compared with the results obtained by humid analysis, generally show a loss varying from five to twelve per cent. The fire assay, however, represents what is produced by smelting lead ores on a large scale, and it is therefore of great commercial use. For the class containing galena, and all lead ores containing either arsenic, phosphorus or sulphur, Mr. George Attwood, in his "Practical Blowpipe Assaying," gives the following simple method of assay:

Take of the finely crushed ore two grains, and mix with three grains of dry carbonate of soda, 0.5 grains of borax glass, 0.5 grains powdered charcoal, and one grain cyanide of potassium. In a small fire clay crucible place two small pieces of wrought iron, about the thickness and length of a small steel pen, and then pour in the assay: cover the assay with about four grains of common salt but allow the ends of the iron pieces to project above the assay charge; put on the cover of the charcoal furnace, (blowpipe described recently in the PRESS) and screw the tightening-pin; apply a reducing flame through the opening made in the furnace, but apply it first in a downward direction, so that the flame does not attack the bottom of the crucible. After a few minutes blowing the assay commences to boil, and the furnace will be found to be at a good red heat. Do not increase the heat until, by a glance through the hole in the top of the furnace, the assay is found to be thoroughly fused; then increase the heat, and with a pair of iron pliers extract the pieces of iron, one by one, whilst the assay is in a thorough state of fusion. After the iron has been taken away, allow the assay to cool slowly.

When cool, break the crucible between two pieces of paper on the steel anvil, and clean the lead button and weigh; examine the slag with a lens, and if any globules of lead are found add them to the larger button. If numerous small globules are found in the slag the assay should be repeated. This assay only takes about eight minutes, and if carefully made it will agree closely with fire assays made on a large scale. The lead button frequently contains a large amount of copper. This can be ascertained by dissolving the lead with boracic acid in a deep bore on charcoal and deducting the weight of the copper found from that already considered to be lead. Lead nearly always contains silver, and also gold, therefore the button should be tested for both these substances.

There is another class which comprises all ores of lead and plumbiferous substances which are free from sulphur and arsenic, or contain only traces of the latter. Litharge, carbonate of lead and minium are the chief substances which come under this class. To assay ores of this class, mix the finely powdered material with four grains of carbonate of soda and one grain of argol, and 0.5 grams of borax glass. Place the mixture in a small crucible, and after covering with three to four pounds of common salt, fuse and treat in a similar manner to ores of the class before described.

IN the old Del Monte workings at Aurora, Esmeralda county, Nev., at a depth of 100 feet, two deserted tunnels intersect, and a strong draft, meeting at the said point of intersection, lowers the temperature beyond the freezing point. There is quite a seepage of water from the upper workings, and as fast as it drops through, at all seasons of the year, ice forms.

A. T. DEWEY, of this office, has recently returned, with his family, to Oakland, after a much enjoyed recreation trip of four weeks in Sonoma, Lake and Napa counties. Friends met by them will please accept grateful thanks for many kind favors extended.

WOOD RIVER and Salmon river continue their favorable reports, and Butte speaks for itself in its immense weekly output of ore and bullion.

Blasting in Mines—No. 1.

In blasting, the exigencies of machine labor render it impracticable to follow closely the principles which lead to economy of labor material. In hand boring, economy is gained by reducing to a minimum the number of holes and the quantity of the explosive substance required. But in machine boring, economy is to be sought mainly in the reduction of the time needed to accomplish the driving. Attempts have been made to assimilate the methods of machine boring to those adopted for hand labor, but the results have not been satisfactory. On the contrary, the conditions determining the position and the direction of the holes relatively to the production of the greatest useful effect have been wholly ignored in favor of those which determine the most rapid boring. This system has been attended with more satisfactory results. Another system, partaking of both the preceding, is widely adopted, and hitherto the best results have been obtained from this, which may be regarded as a compromise between conflicting conditions. Thus we have three systems of executing machine boring; one in which a single machine is used upon a support capable of holding it in any position, so as to be able to bore at any angle, and in which the holes are placed according to the lines of least resistance, as in hand boring. A second, in which several machines are fixed upon a heavy support, allowing but little lateral or angular motion, and in which the holes are placed at regular intervals apart, and bored parallel, or nearly parallel, with the axis of the excavation, irrespective of the varying nature of the rock, and the lines of least resistance. And a third, in which it is sought, by the employment of one, two, or at most three machines, upon a simple and light support allowing the position and direction of the machine to be readily changed, to satisfy, in some degree, the two sets of conditions determining the two former systems, by placing the shot holes as far in accordance with the lines of least resistance as the exigencies of a fairly rapid handling of the machine will allow.

In executing the boring, it is very necessary to keep the holes free from debris. Bits must be chosen to suit the rock and the hole kept well supplied with water. The absolute number of holes required in any case will, of course, depend upon the tenacity of the rock and the development of the jointing planes, and also, in some degree, by the lines of fracture due to the preceding blast. The same circumstances will determine the distribution of the holes. Leaving minor variations out of account, however, the same distribution will be adhered to throughout the driving. The manner of distributing the holes over the face of the heading may be varied according to the judgment of the engineer in charge; that is, the general features of the distribution to be adopted, may be chosen to suit the requirements of the machines and their supports. Also, it should be noted that one method of distributing the shot-holes will require a less number of them than another. Some samples are shown in the engravings, which are from "Andre's Coal Mining." Fig. 1 represents the heading of the Mt. Cenis tunnel. Fig. 2, the Goschenen end of the St. Gothard tunnel. Fig. 3, the Airolo end of the same tunnel. Fig. 4 represents the face of a stone drift driven at Marihaye. Fig. 5, a similar drift at Anzin, and Fig. 6 a drift of the same character at Ronchamp, the latter three examples being typical of the distribution adopted in the French collieries.

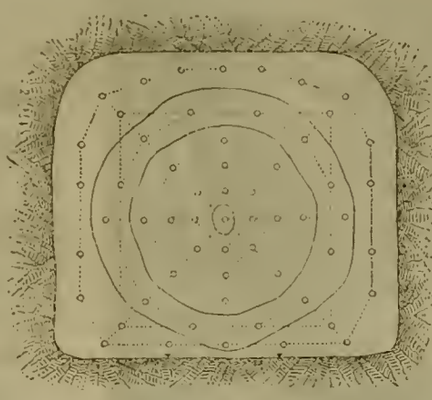


Fig. 1.

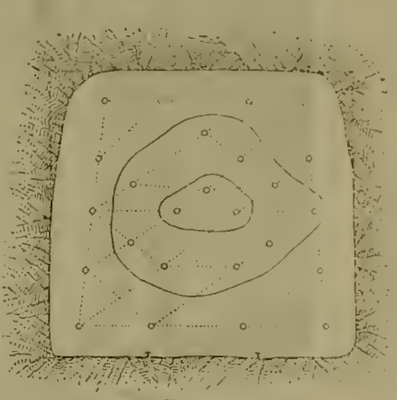


Fig. 2.

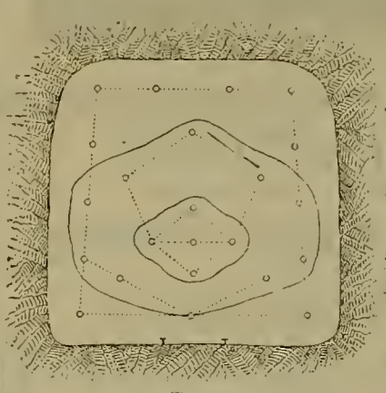


Fig. 3.

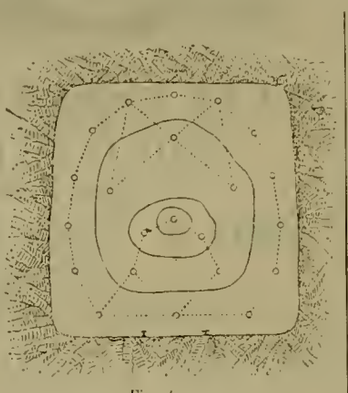


Fig. 4.

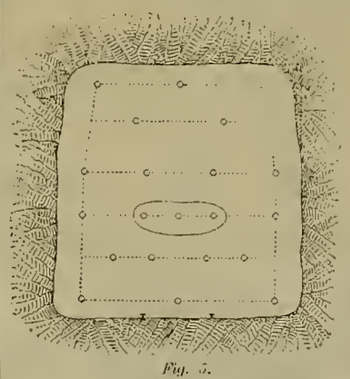


Fig. 5.

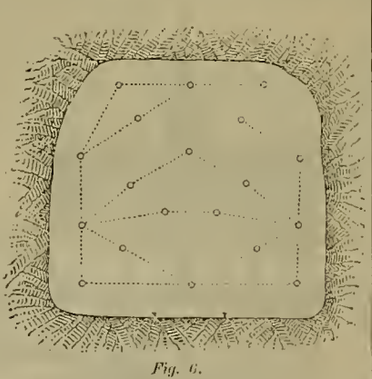


Fig. 6.

DIFFERENT METHODS OF BORING FOR BLASTS.

THE LEACHING PROCESS WINS.—The Belmont *Courier* says: "The Belmont Mining Company's mill was running last week for the purpose of ascertaining which of the two processes, namely, "amalgamating" or "leaching," is the best and cheapest. Following is the result of the test: By the amalgamating process—bullion produced, 837 ounces; 441 fine; assay value, $477.25. By the leaching process—bullion produced, 530 ounces; 925 fine; assay value, $633.88. The conclusion is, therefore, arrived at that the leaching plan is the best. In the adoption of this method we seem in fact to be to some extent working back along the line of the Creator's movement."

Foundry Notes.

Some very important improvements are shortly to be made at the Pacific Rolling Mills, by which they will be able hereafter to make their own steel. Mr. Noble, the Superintendent, has recently returned from the East, where he has been studying up the subject of the Siemens-Martin process for the manufacture of steel. A complete plant of a capacity of thirty tons per day will soon be put up, and preparations are now being made for this addition to the mill. Most of the machinery will be made here, though some of it will come from the East. A fine Worthington Duplex pump has been purchased for the hydraulic accumulator, to work the machinery of the melting house. It has two fourteen-inch high pressure cylinders; two twenty-inch low pressure cylinders, and a six and a half inch water cylinder.

It is proposed to make fine steel and build up a market for it on this coast. Steel will be made for forgings, shafting, structural shapes and rails.

No steel has been yet made on this coast. The mills have been rolling steel brought from England for the last three years, but they will now make their own. The new tariff now shuts out most of the English steel, and the majority of what we use comes from the East.

The rolling mills are quite busy at present, and employing from 750 to 800 men steadily. They are working largely in manufacturing goods. They have just finished the job of the material for the Market street cable road, and now have the contract for the material for the Sutter street road. We shall give some further details of the new steel works at the rolling mills in a short time.

SAN LUIS OBISPO is to build a big hotel.

Pacific Coast Inventions.

The MINING AND SCIENTIFIC PRESS Patent Agency is obtaining—as it has been for some years—the large majority of all the patents issued by the government to Pacific coast inventors. The business, however, is by no means confined to inventors on this coast, as patents are frequently obtained for foreigners and inventors in Eastern cities, a fact which our weekly lists and records prove. Dewey & Co.'s Patent Agency has been in existence so many years that the managers have a very thorough acquaintance with the needs of our inventors, and are thoroughly familiar with the details and requirements of the Patent Office. As a result, they have been very successful in obtaining patents, a fact which inventors recognize.

Within the past few years the number of inventors has greatly increased in the Pacific States and Territories. The exigencies to be met in comparatively new or isolated regions seem to sharpen men's wits, and when difficulties are encountered they are apt to be met by the individual without the usual dependence being placed on others. This has fostered invention in many branches. Moreover, new industries have arisen among us which needed appliances of a peculiar nature. In advice and assistance, Dewey & Co.'s Patent Agency has been of great service to these inventors, preparing their papers, informing them of the state of the art, and smoothing out difficulties, which their experience has enabled them to do. As a consequence, there has been a gradual increase of patronage from year to year, as is evidenced by the increased list of patents granted to Pacific Coast inventors.

THE strike of telegraph operators continues.

Primitive Bullion Makers.

The old arastra and Chile mill for crushing and grinding ore, and for amalgamation, though rude in construction and really "primitive," do their work well, but do it slowly as compared with machinery of modern date. While we have excelled in speed we have not done so much better in resultant yield as might be supposed. For pocket mines and distant localities where a few men work their own mines, the arastra still holds its own, nothing having been perfected to entirely displace it. A mule or two, with one of these rude appliances, will turn out many a profitable dollar, where a quartz mill with engine would entail failure. Of course, we speak of small mining operations.

In the line of smelting, the old Mexican or "Adobe" furnace has its merits also. We recently described this long-used furnace. It differs much, of course, from the modern water jacket, though the basis of operation is the same in both. It is simply the production of lead bullion carrying silver, the bullion in the case of the adobe smelter in question being afterwards refined, or the silver separated from the lead in a reverberatory refining furnace, and the litharge kept on hand for use over again with each lot of ore to be smelted. By this means the smelter can do without the large proportion of lead ores so essential to success in the case of furnaces of large capacity, where refining the bullion is not practiced. One of these adobe furnaces now running at Silver City, New Mexico, is said by a local cotemporary to be producing silver 96 fine. The two furnaces, both smelting and refining, are constructed of common adobes and much after the manner of the ordinary old-style brick concerns, that were in use until the water-jacket supplanted them. Of course, the mechanical construction is miserable, and the blast is furnished by a common large-sized bellows, while the surroundings are not of a kind such as one might see in more modern establishments. The silver is produced, nevertheless, and at a cost much below that which would be incurred by combined shipping and treating rates, were the ore sent elsewhere. Conversing with the man at the head of the concern, it was learned that the average charge was about 300 pounds, 100 pounds consisting of litharge and the balance of raw ore. One charge is usually smelted a night, while the furnace is in blast, and the manager states that to work night and day for a week, about 4,000 pounds of material could be run through, at a cost of about $70, or $35 per ton. The slag from the blast furnace contains about $5 per ton.

With a little "adobe" a lot of ore can be smelted as soon as produced from the mine, and the hand-to-mouth principle of the pocket mines is repeated. The trouble of handling ore in bulk is saved and the ore is made to yield its contents as soon as it comes from the mine. The adobe smelter is by no means to be despised despite its antiquity and crudeness of construction.

THUNDERING DOWN THE MOUNTAIN.—In widening the trail up Mount Scowden, a few days since, it became necessary to blast away a disjointed mass of granite forty feet long and twenty feet high. A charge of giant powder having been placed behind it and fired, the great block, weighing some 200,000 pounds, was toppled over into the smooth rocky bed of a steep ravine, leading down the side of the mountain 2,000 feet. Sliding down this smooth channel, the huge mass acquired at once a fearful velocity, and leaping more than a hundred feet at a bound, threw off great fragments that whirled through the air like a shower of cannon balls, one piece, weighing over a ton, striking at the base of the mountain and leaping clear across Mill creek, and burying itself deeply in the opposite bank. The miners in the neighborhood, startled by the concussion, supposed for a time that an earthquake had occurred.

THE Homestake Mining Company, of Dakota, has declared its regular monthly dividend of 40 cents per share, or $50,000, payable at New York. This makes $350,000 this year, and $2,112,500 since the commencement.

THE gross bullion product of the Tombstone mine for June was $51,400.

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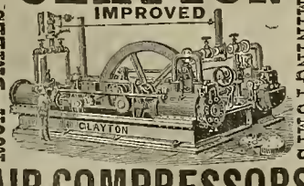
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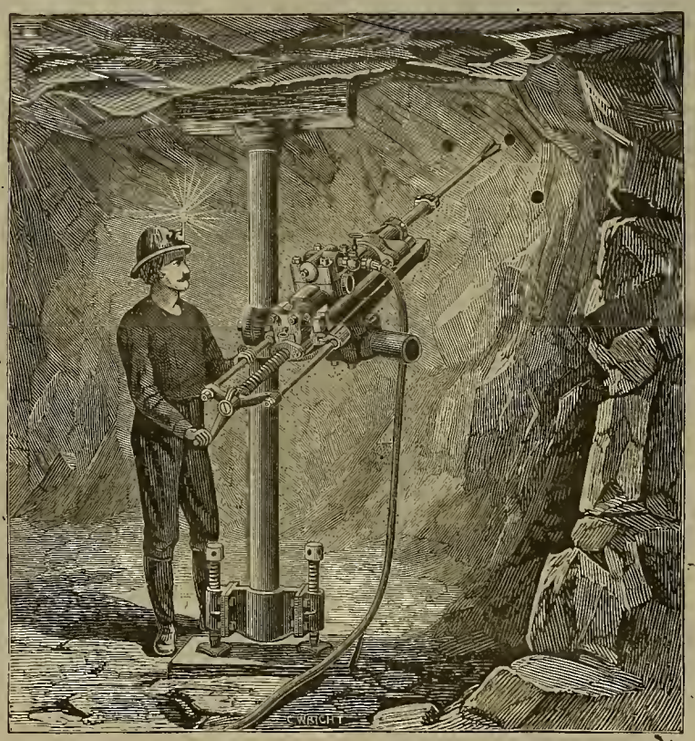


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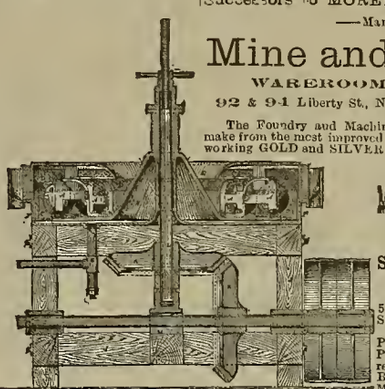
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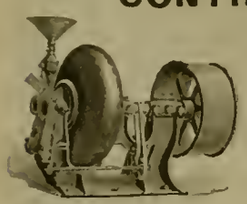
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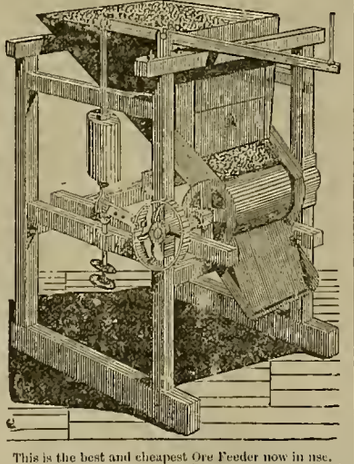
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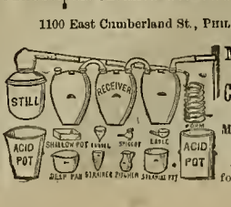
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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & CO.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F

FOR WEEK ENDING JULY 17, 1883.

281,236.—SPRING DRAFT TUG—Otto Brunck, S. F.

281,338.—ARM REST—Wm. J. Butler, Salinas, Cal.

281,448.—SEALING ENVELOPES—H. A. Buttner, San Quentin, Cal.

281,341.—MAGAZINE GUN—Howard Carr, S. F.

281,459.—WATER WHEEL—Geo. W. Converse, Spokane Falls, W. T.

281,461.—ANIMAL TRAP—Jas. H. Cook, Lone Pine, Cal.

281,492.—PIPE GRAPPLE—E. K. Green, Los Angeles, Cal.

281,507.—FRUIT PITTER—N. B. Hicks, San Bernardino, Cal.

281,511.—MACHINE FOR GRINDING ORES—Wm. H. Howland, S. F.

281,370.—WAVE POWER—W. E. Jory, S. F.

281,525.—PEN OR PENCIL HOLDER—Wm. Lane, S. F.

281,550. SAFETY DEVICE FOR ELEVATORS—C. C. Palmer, Oakland, Cal.

281,396.—APPARATUS FOR FILLING BOTTLES, ETC.—C. C. Redmond, San Jose, Cal.

281,399.—SMOKE BURNING ATTACHMENT FOR STOVES, ETC.—Wm. H. Richardson, S. F.

281,568.—EXTENSION SHANK FOR BITS—C. Schoch, Truckee, Cal.

281,403.—MANIFOLD WRITING CASE—Scott & Gordon, Santa Cruz, Cal.

281,598.—DISH WASHER—Ella Wiseman, Fulton, Cal.

281,401.—STEAM MOTOR BOILER—Josef Schreiber, Vienna, Austria-Hungary.

281,373.—COFFEPOT—Thos. Keys, Chicago, Ill.

10,435.—TRADE-MARK FOR VINEGAR MADE OF WINE—Pacific Vinegar Co., S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Amoug the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

ARM REST.—Wm. Butler, Salinas, Mouterey Co. No. 281,338. Dated July 17, 1883. This invention relates to a new and useful rest or support for the arm, the object of which is to enable one to steady his hand in aiming with a rifle or other fire-arm, or a bow of any description, or in sighting a telescope or spy glass, or for any other purpose which requires a firm and steady support. The left arm is fitted through an elastic band up to a point just above the elbow. The arm is turned with the palm of the hand up to grasp the rifle underneath, and the curved metal strip bears under the arm. A short arm or plate extends along the under side of the arm to the body, and the lower arm of the plate passes down the left side of the body, being secured firmly thereto by straps. A ratchet and pawl is so arranged as to hold the support and the arm. The arm is firmly supported at any inclination desired. The device is particularly useful as a rifle rest.

HEAD-BLOCK GEAR FOR SAW MILLS.—Melvin C. Meeker, Occidental, Sonoma Co., Cal. No. 281,100, Dated July 10, 1883. This iuvention relates to improvements in the gear for setting up the head-blocks in saw mills. The improvements consist in an arrangement of gears and clutches by which the head-blocks, when set up, may be drawn back with rapidity, thus losing no time, and also in a certain arrangement of levers joined to a single lever, and means for disengaging those of either end to operate both blocks, or only one, as the character of the work may demand. The object of the device is to enable the operator, after the log has been sawed up, to draw the knees back with greater rapidity than they are set up, to save time, and also to set both or either knee to such position as each particular log may require, or the object in view demands, such as is required in sawing telegraph poles and other tapering work.

MAGAZINE GUNS.—Howard Carr, S. F. No. 281,341. Dated July 17, 1883. The improvements in magazine guns covered by this patent are especially applicable to what is known as the "Winchester rifle breech mechanism." It consists of certain improvements in the carrier block, the firing bolt and extractor of empty shells, and the magazine by which the gun is adapted to fire cartridges of small caliber for gallery use. In such a gun as is used to kill small game, as squirrels or birds, with fulminating powder and small balls, the recoil from such ammunition is so small, no powerful recoil or breech block is needed, as the bolt is sufficient for the purpose.

COFFEE POT.—Thomas Keys, Chicago, Ill. No. 281,373. Dated July 17, 1883. Inside the main vessel is a coffee holder with a perforated bottom and partially perforated sides. The object of the peculiar construction is to expose as great a surface of the ground coffee to the action of the water as possible and to permit the water to permeate the mass with better effect and more thoroughly than if the bottom alone was exposed to its action. There is a suitable rim to prevent grounds passing out over the top when the pot is held at an inclination to pour out coffee from the spout. There is also a cap or cover for the end of the spout, which may be readily applied, and when not in use will still be at hand without being liable to be misplaced.

STEAM MOTOR BOILER.—Josef Schreiber, Vienna, Austria. No. 281,401. Dated July 17, 1883. This improvement in boilers consists of a boiler shell, supported upon and within an inclosing casing or stand, within which the grate or heating apparatus is contained. A series of tubes depend from the bottom of the boiler into the furnace, and within these are suspended smaller circulating tubes. The feed water enters the boiler after passing through a heating coil, and is caused to enter the small circulating tubes, through which it is led to the bottom of the inclosing tubes, converted into steam, and led through tubes to the upper part of the boiler without being reduced in temperature by passing through the body of water within the boiler. Steam for the engine is taken from the upper part of the steam space and passes by a pipe, through the fire space, where it is superheated before its exit.

MANIFOLD WRITING CASE.—Frank D. Scott and Oscar L. Gordon, Santa Cruz. No. 181,403. Dated July 17, 1883. This is a novel case or table for producing manifold impressions of writing. The object is to provide a convenient means for producing manifold impressions, for use by clerks and salesmen in stores, or for any uses requiring copies. The box is convenient to carry and furnishes a good surface on which to write. The layers of paper are always in position and the carbon paper need never be handled. When a memorandum is made, the ends of the writing papers are grasped and drawn out under the bands until they reach a point where a cutter will sever them below the writing. They are then torn off against the cutter with ease and precision. The sheets pass off the rolls within the box without interference. New rolls of paper may be readily inserted.

SMOKE BURNING ATTACHMENT FOR STOVES.—Wm. H. Richardson, S. F. No. 281,399. Dated July 17, 1883. This invention relates to an attachment to stoves, furnaces and radiators, and it consists of a chamber, formed in the pipe, between the furnace and the chimney, and a supplemental pipe leading therefrom to a point below the grate, and, in connection with these, of a damper or valve, whereby the products of combustion are returned to the body of the stove, furnace or radiator, through the space below the grate bars, to be exposed to the action of fire again, before finally escaping to the chimney.

ANIMAL TRAP.—James H. Cook, Lone Pine, Inyo county, Cal. No. 281,461. Dated July 17, 1883. This is a new animal trap of that class known as the "gravitating platform," in which the weight of the animal causes the foundation to give way and precipitate him into a receptacle. In this there is combined with the receptacle a cover, or lid, formed with a number of independent, hinged spring flaps, or sections, operating entirely below the level of the top of the trap, and hinged at the extreme outer edges. There are springs for resetting each section, and a bait arm for suspending the bait over the center of the trap.

WAVE POWER.—Wm. E. Jory, S. F. No. 281,370. Dated July 17, 1883. This invention relates to that class of devices specially adapted to be affected by the waves, and commonly known as "wave powers." It consists in a float having vertical screws connected with the main shaft by gearing, which transmits the vertical movement of said screws in a peculiar manner. The object is to provide a simple and effective means for utilizing the power of the waves and tides.

UTAH'S BULLION.—The Salt Lake *Herald* estimates that the bullion yield of Utah for the six months ending June 30, 1883, at $4,500,000. The monthly receipts of bullion at Salt Lake have been as follows for the period: January, $473,026; February, $577,041; March, $664,572; April, $563,342; May, $506,565; June, $453,480; total bullion, $3,238,026. This is exclusive of the value of the ores shipped to outside smelters. The product of the Mingo smelter is not included, nor any of the Silver Reef smelters, except the Stormont. The Crescent City mine has yielded much, but there are no returns from that mine in the above total. The Ontario mine has not done as well as usual, owing to improvements in progress.

THE Portland (Or.) *Daily News* reports that John McCafferty, from New York, has been prospecting for coal leads, and has located eighteen miles south of Renton three sections of land, the coal from which will make excellent coke. A company has been formed to reduce the coal to coke, which will be shipped to Butte, Montana, to be used in the reduction of silver ores, in which Mr. McCafferty is interested. These coal fields are said to be on the Seattle branch railroad.

IN 1872 the production of copper in the United States was 28,000,000 pounds, and in 1882 it had risen to 88,000,000. The Pacific coast raised the figures greatly.

The Late Wm. J. Lewis, Civil Engineer.

The subject of the following notice was well and favorably known to most of the old residents of San Francisco; but owing to his retiring and shrinking nature and habits, only a very few, even of his intimate friends, were acquainted with his life history. A brother engineer, another of San Francisco's old and respected citizens, Sherman Day, has furnished us with a brief obituary which will no doubt be read with much interest by our readers generally:

Wm. J. Lewis was born in Chester county, Penn., April 4, 1812. His father was a teacher of the Quaker denomination, eminent for his skill in mathematics, and anthor of several works on arithmetic and algebra. The elder brother of W. J. Lewis—Judge Joseph J. Lewis, of Westchester—was Commissioner of Internal Revenue under President Lincoln. William inherited his father's mathematical talent, and at the early age of sixteen was a correspondent of the *Mathematical Diary*, a New York paper, solving some twenty difficult questions in mathematics. Throughout his life nothing seemed to please him more than to sit up all night solving some intricate problem. He received his early education from his father. He chose civil engineering for his profession, and served as an assistant under John Edgar Thomson, an eminent engineer of Pennsylvania, who had been a pupil of Lewis' father. After a sufficient experience gathered in that school he became a resident engineer on the Louisville, Cincinnati and Charleston railroad, at a period when John C. Fremont was employed on the same work. He afterwards served successively as Chief Engineer of the Brooklyn and Jamaica railroad, on Long Island, and of the Norristown, Doylestown and New Hope railroad and of the New Jersey Central railroad. Afterwards, for the six years from 1842 to '48, Mr. Lewis was a teacher in Philadelphia. During the three last years of this term he was at the head of a school of his own for teaching mathematics and engineering.

In the year 1849 he came to California as a member of one of the companies, so common at that time, for mutual outfit and protection. The company commenced work in the placer mines at Sullivan's diggings in Tuolumne county, but they soon dissolved as a company; some staid in the mines and some left, and among the latter was Mr. Lewis. An Irishman of the company, who stuck to the mines about sixty days and then left, being questioned as to his reason for leaving, replied that mining didn't suit his "jaynius." Mr. Lewis was probably actuated by the same motive. He came to Santa Clara county, and during the first year was associated with Mr. Hathaway, Captain Winslow and others in cultivating a small tract in the southern suburbs of San Jose. But farming was no more to his taste than mining, and he opened an office in San Jose in 1850 for the practice of his regular profession. He also went into partnership with a brother surveyor for owning and cultivating a 100-acre tract near San Jose, but the place which they occupied for about three years was of more value as a surveyor's home than for the profits of cultivation. Soon after the county of Santa Clara was organized, Mr. Lewis was appointed County Surveyor. He was elected to the same office in 1852, and re-elected in 1854, retaining the office until June, 1855, when he resigned to accept the office of City Surveyor of San Francisco. His surveys in the county of Santa Clara were characterized by accuracy, impartiality and neatness of mapping, and the records of them are regarded as specially reliable.

In September, 1851, he was selected as chief engineer to make the preliminary survey and location of the San Francisco and San Jose railroad, which he performed during the autumn of that year, presenting a satisfactory report and map. The funds for the construction of the road were not raised for several years, and it was not till 1855 that he was called to make a second survey, and a third in 1861, when its construction was begun, and he remained Chief Engineer till 1863. While the San Jose railroad remained in abeyance, he made a preliminary survey of a railroad from Marysville to Benicia. After the completion of the San Jose road in 1863 he became Chief Engineer of the Western Pacific railroad, from San Jose to Sacramento, while it was under the charge of Judge Dame, previous to its transfer to Stanford & Co. He also made a survey for the extension of the San Jose railroad to Gilroy. In 1853 he was appointed U. S. Deputy Surveyor, and between that date and 1861 he surveyed a large number of ranches under Mexican grants, and several at still later dates.

Among these surveys was one of the line between the claims of the New Almaden Mine and the Capitancillos rancho, involving the evidence to be derived from the growth of trees blazed long years since. The chips from these old blazes were cut out and exhibited at the trial before Judge Hoffman; and in his evidence Mr. Lewis referred to the old trees which he had seen during his railroad surveys in South Carolina at the battlefield of "The Cowpens;" these trees still carrying the balls shot into them at the time of the battle. Another very important one of his ranch surveys was the location of the "Panoche Grande" grant—(McGarrahan's)—according to the calls of the grant which placed it between two well known adjoining ranches named in the grant, and limited the number of leagues. After having finished his location on the ground, Mr. Lewis inquired of some of the party in attendance,—"now where is the New Idria Mine?" And he said "they pointed it out as near a mountain away off to the south in the blue distance about 25 miles."

In June 1855 he was appointed city surveyor of San Francisco, which place he held until the passage of the Consolidation Act in 1856, when the county officers supplanted those of the city. In 1866 he submitted plans for the sea-wall around the waterfront of San Francisco, which were accepted, and he was appointed Chief engineer in May 1867 to superintend the work. He held this position until 1870.

Whenever Mr. Lewis was in charge of any work as Chief Engineer, he took hold of it with enthusiasm and diligence, bringing to it his extensive practical experience, and displaying much executive ability in his selection of assistants and subordinates, and in the details of the management; and his notes, records and reports were carefully made and entitled to full confidence. No charge of incapacity, or trickery, venality or "crookedness" was ever breatbed against him. He was a man of the strictest integrity; in social manners affable and unostentatious; and universally esteemed by those with whom his professional business brought him in contact, as well as by his professional brethren. Mr. Lewis derived his appellation of "Colonel" from an appointment as Engineer on the staff of Major Gen. Halleck then of the State Militia, a few months before the civil war.

After the leading railroads of California past under the control of the owners of the Central Pacific, the business of railroad engineering in California fell mainly into the hands of their engineers; and those who had not enlisted under their banner were left out in the cold. Mr. Lewis was one of the latter. He still continued to attend to the surveying of ranchos, and smaller tracts, and such occasional miscellaneous engineering as offered. He was frequently called on to make elaborate computations, and write up notes where special accuracy in figures was needed. He sought for a position, for which he was eminently fitted, as a teacher of mathematics, but in this he was not successful. He occasionally contributed articles on his favorite science to the public press.

When he removed to San Francisco his wife and only son joined him from the East, and he purchased a homestead in this city, where they dwelt pleasantly for more than a quarter of a century. But a dark cloud was cast over their home by the death of their only child, a son just coming to manhood, who was accidentally killed on the San Jose railroad some years since. Mrs. Lewis, a most estimable lady, who had been the main light and comfort of his home, died a little more than a year before her husband. Mr. Lewis still continued to dwell at his old home, but the last year of his life was a lonely and sad one for several reasons, until at length his naturally strong constitution yielded to an attack of kidney disease, and he died on the 7th of July, 1883, at the age of seventy-one. He leaves one brother in this State, a farmer in Santa Cruz county, and another in Minnesota.

A HISTORY OF CALIFORNIA.—A. Roman, of 120 Sutter street, S. F., has just published a revised and enlarged edition of "A Popular History of California" from the earliest period of its discovery to the present time, by Lucia Norman. It is amost excellent little work (216 pages), and not simply a dry statement of facts, names and dates, but is written in an animated and elegant style. It is comprehensive and compact—a marvel of conciseness—from the preface to the end. The only illustration in the book is an excellent copy of Nahl's famous painting, "The Sutter Mill," which has now become an historical picture, so much prized by all early Californians. The book is for sale at all book stores, and mailed to any address, postage paid, upon the receipt of price by publisher.

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Successful Patent Solicitors.

As Dewey & Co. have been in the patent soliciting business on this coast now for so many years, the firm name is a well-known one. Another reason for its popularity is that a great proportion of the Pacific coast patents issued by the Government have been procured through their agency. They are, therefore, well and thoroughly posted on the needs of the progressive industrial classes of this coast. They are the best posted firm on what has been done in all branches of industry, and are able to judge of what is new and patentable. In this they have a great advantage, which is of practical dollar and cent value to their clients. That is this understood and appreciated is evidenced by the number of patents issued through their SCIENTIFIC PRESS Patent Agency (S. F.) from week to week and year to year

Cheap Ore Pulverizer.

There is for sale in this city, by I. A. Heald, American Machine and Model Works, 111 and 113 First St., a Rutherford Pulverizer, an improved revolving barrel crusher, which was only used a few times and is as good as new. It will be sold very much below cost, and miners who are in need of such an appliance for a small mine will do well to make inquiries concerning it. It is suitable for a pulverizing mill for powder or other substances. References as to above can be had upon applying to this office.

Mechanics' Institute.

The Mechanics' Institute of this city is now taking some little trouble to increase its membership, and rendering the advantages it possesses available to a larger class of people. The trustees have issued cards inviting the public to pay a visit of inspection to the library and reading rooms on any Saturday evening. There will be some one to escort visitors around the rooms and explain to them the workings of the Institute.

The library rooms are large, well lighted, easy of access, and include a private conversation and reading parlor for ladies. The library contains 33,000 volumes, the circulating department, 16,000; is well selected, and new standard and popular works are added as they appear. The reference department is unusually comprehensive, contains many valuable works not possessed by other libraries on this coast, and is recognized as the best educational library in the State. Members enjoy all the privileges of a private library, the rules permitting personal access to the shelves. The reading rooms are well supplied with papers, magazines and reviews from all parts of the world, especial attention being given to scientific and educational publications. The chess room is the largest and finest in the country, and the strongest players on this coast, attracted by it, have become members of the Institute. This institution has been made the official repository for patent reports by both the English and American governments, thus making membership of benefit to manufacturers and indespensable to inventors.

The dues are only fifty cents per month and the initiation fee $1, while a life membership may be purchased for $50. The trustees have wisely concluded also to give members of the Institute double or single season tickets for the coming fair, for half the usual price. For general information we append the following on this subject: The double season ticket will admit the owner and any lady and one child, under eight; or, any two ladies and one child, under eight; or, any lady and two children, under eight; or, the owner and two children, under eight, but must not be presented by any gentleman other than the original owner. If a lady member purchases a double season ticket, it will be issued as a lady's ticket, in her name; no gentleman can use it, but any two ladies and one child, under eight, can have admission thereon. The single season ticket is not transferable. Tickets at above reduced rates are sold to members only. The price of tickets to the general public is unaltered, viz.: Double season, $5.00; single season, $3.00; child's season, $1.50; apprentices season, $1.50; adult single admission, 50 cents; child's single admission, 25 cents.

THE Salt Lake *Tribune* hears of an important mining sale in American Fork canyon, in which Mr. Natt. Cullen, of Horn Silver fame, sold to John M. Burke, Esq., and Delaney Bros., a half interest in three mining claims for $70,000—the Mary Ellen, Live Yankee and Extension. It is a good sale, and we understand the purchasers will proceed at once to the thorough opening of their property, in which there are large bodies of ore.

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COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $4 a year, in advance. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times,) by turning a leaf.

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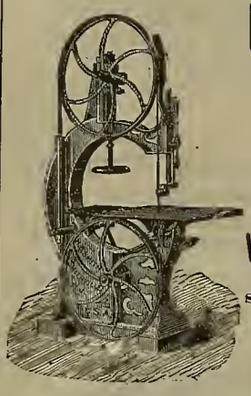
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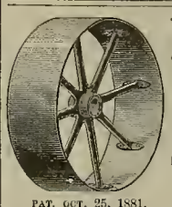
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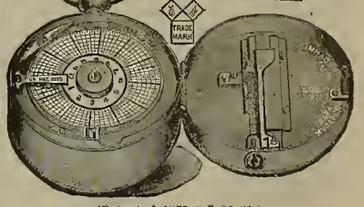
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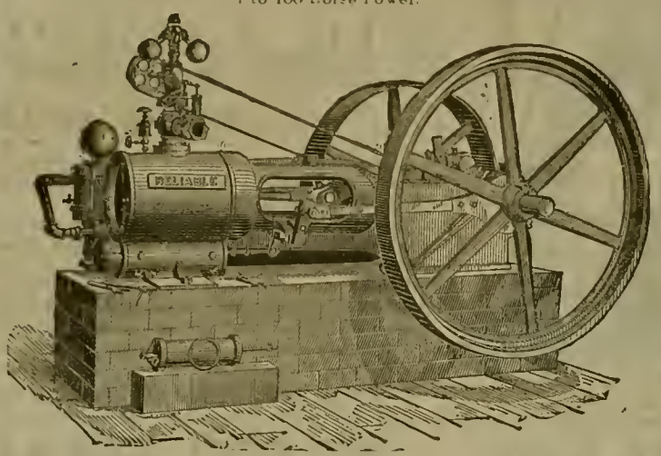
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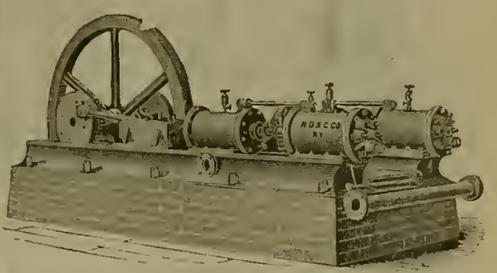




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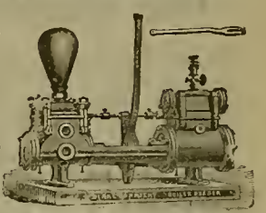


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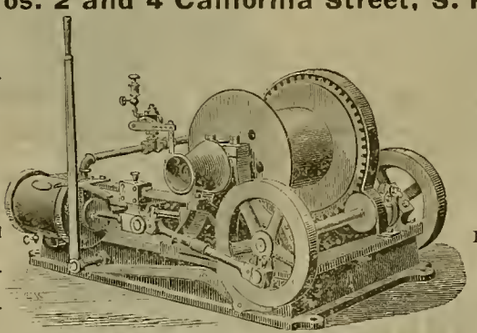


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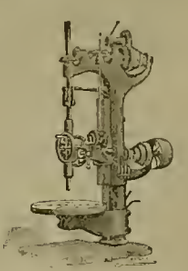




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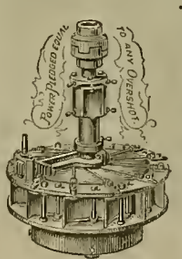
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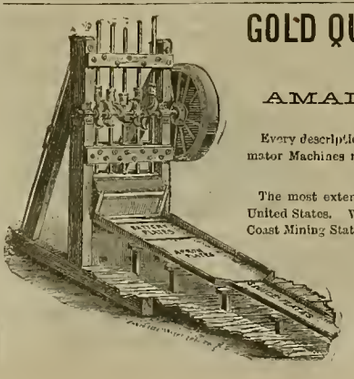
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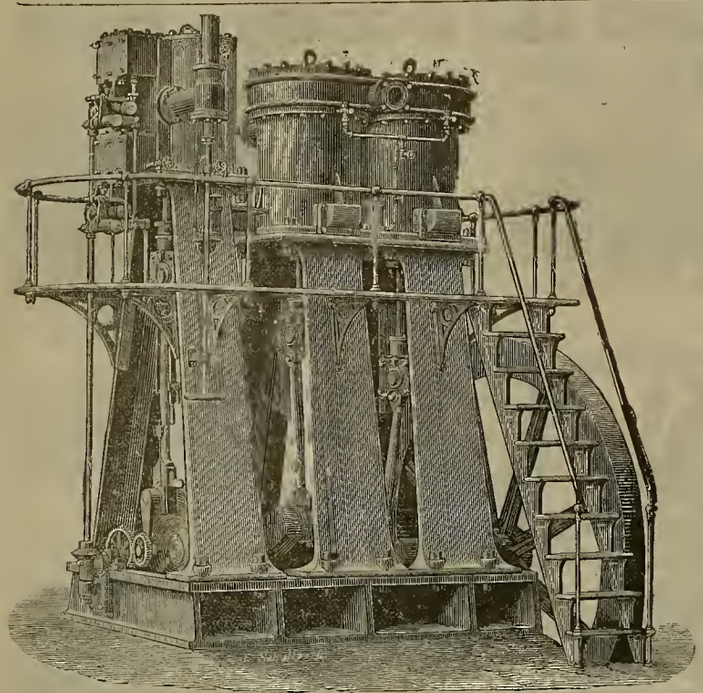
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It derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.

No. 1 (XX) is the Strongest Explosive Known.

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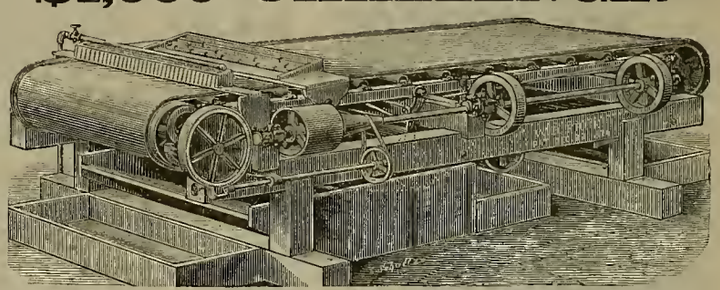
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Over 400 are now in use, giving entire satisfaction. Saves from 40 to 100 per cent. more than any other Concentrator in use, and concentrations are clean from the first working. The wear and tear are merely nominal.

A machine can be seen in working order, and ready to make tests, at the office of Hinckley, Spiers & Hayes, 220 Fremont Street.

To those intending to manufacture or purchase the so-called "Triumph" Concentrator, we herewith state:

That legal advice has been given that *all shaking motion* applied to an *endless traveling* belt used for concentration of ores is an infringement on patents held and owned by the Frue Vanning Machine Company.

That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.

That the patent laws make *users* of infringements responsible as well as makers, and the public is therefore warned that there is considerable risk in purchasing any end-shake machine until our various patents have been decided.

That if there are those who for any reason prefer an end-shake machine, we can manufacture and sell to such a machine of that description, as efficient as the Triumph, and at a lower price, and no liability for infringement will then be incurred by the purchaser.

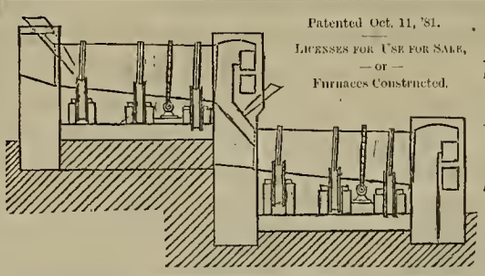
That we shall protect ourselves against any one making, selling or using any machine infringing any of our patents. Patented July 9, 1867; May 4, 1869; Dec. 22, 1874; Sept. 2, 1879; April 27, 1880. Patents applied for.

That we are, and have been, ready at any time, to make a competitive trial against the Triumph, or any other machine, for stakes of $1,000.

ADAMS & CARTER, Agents Frue Vanning Machine Company,

Room 7, 109 California Street, - - - SAN FRANCISCO, CAL

Nov. 6, 1882.



Patented Oct. 11, '81.

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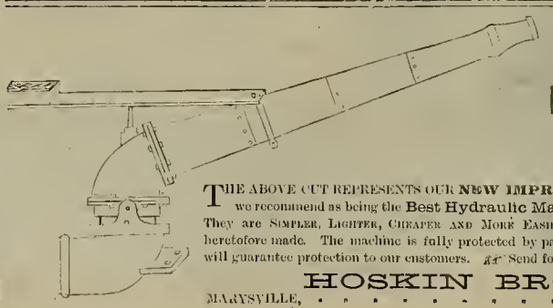
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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, AUGUST 4, 1883.

VOLUME XLVII Number 5.

Utilizing Lead Fumes.

Ordinary commercial oxides of lead have usually been manufactured by heating metallic lead in an oxidizing reverberatory or revolving furnace, or by heating white lead in such furnaces to drive out carbonic acid and combined water. It has been found, however, that the same oxides of lead may be manufactured more economically from the waste lead fumes of lead smelting furnaces. The composition of waste lead fumes depends much upon the character of the lead and of the lead ore being smelted, and also upon the kind of furnace used.

An inventor has discovered that by subjecting waste lead fumes to the action of carbonate of soda, or caustic soda, the arsenious acid is made soluble and the sulphate and sulphite of lead are converted into compounds, from which by roasting may be produced commercial oxides of lead. By the roasting process the carbon is oxidized and burned out, while the sulphurets and lead are converted into sulphurous acid and oxide of lead. This can be done by mixing the waste lead fumes with soda ash and burning this mixture in an ordinary litharge furnace till the proper color is obtained. Then the mass is taken out and washed to separate the soluble part from the insoluble, and the oxide of lead is finely ground for the market.

In the various samples of waste lead fumes analyzed, and in descriptions of analyses on record, it is found that waste lead fumes contain more or less carbon and sulphurets of lead, while much the greater portion of the lead present is in the form of sulphate, sulphite and oxide of lead. There is also generally present more or less arsenic—say from 7 to 20 per cent. In a sample of waste fumes from the smelting of argentiferous lead ore, was found: 0.50 moisture, 1.50 carbon, 53.79 sulphate of lead, 29.34 oxide of lead, 2.67 sulphurets of lead, 8.09 arsenious acid, 0.005 silver, 2.28 oxide of zinc and 1.825 antimonious oxide, oxide of iron, alumina and lime.

The following is the modus operandi as carried out by the inventor: The waste lead fumes are made into a pulp by water and then boiled with a solution of caustic soda, or for economical reasons, better, with a solution of carbonate of soda from one-half to one hour and longer, if much arsenic is present. The amount of carbonate of soda varies with the composition of the waste fumes. Each equivalent (151.5 parts) of sulphate of lead and (143.5 parts) of sulphite of lead, requires one equivalent (53 parts) of carbonate of soda; and to each equivalent (99 parts) of arsenious acid, one equivalent (53 parts) of carbonate of soda, though less might be used, while more is unnecessary.

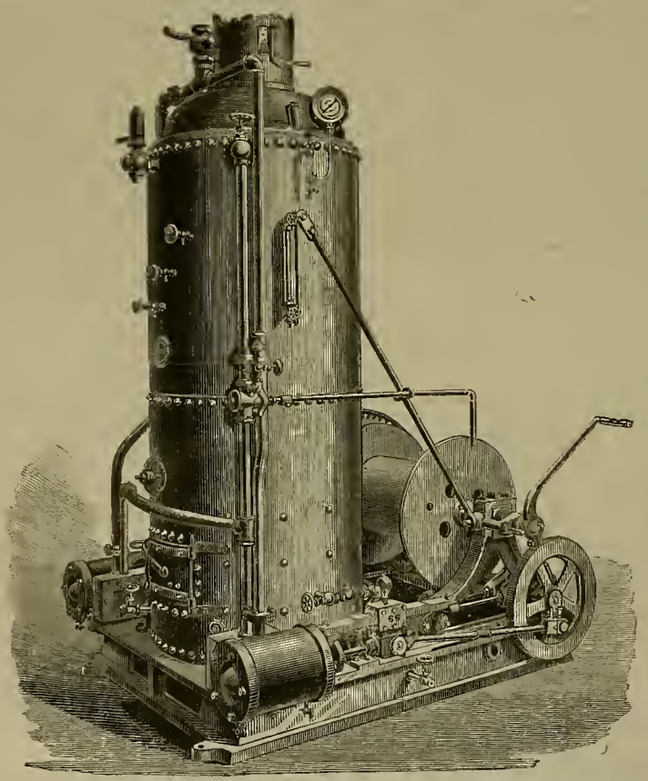
For 1,000 pounds waste fumes of the above composition, should thus be used about 232 pounds of carbonate of soda, or its equivalent of commercial soda ash. After boiling the insoluble part is allowed to settle and the mother liquor is run off, and the arsenic may be eliminated from this, and the sulphate of soda gained by evaporation and crystallization. The insoluble part is washed well, and is then ready for the furnace. It is preferable to press it first in a filter press, and then place the pressed cakes in the furnace, where it is changed into litharge or red lead, according to the temperature and time employed. After burning the oxide of lead is ground, and is then ready for the market.

The Lidgerwood Mine Hoist.

The Lidgerwood portable hoisting engines, while fitted for pile driving, wharves, etc., are specially adapted for mines and quarries and for prospecting purposes. The patent friction drums are a decided improvement on the old clutch engines for every kind of hoisting duty. They are quicker to manage and handle. The friction is composed of iron and wood, the wood being of the hardest kind, placed endwise of the grain to the wear, and will last for years with all kinds of hard duty. The hoisting engines are of recent design, and contain all the improvements suggested by years of experience in this particular line.

The design is of the smaller or dummy locomotive type, and all their connections, valves, steam passages, pistons, etc., are calculated, balanced and fitted for rapidity of action, economy in use of fuel, durability, etc. Steel is used throughout for piston rods, valve stems, cross heads, crank, valve and pump rod pins. The cross head gibbs and connecting rod boxes are of the best composition. All journal bearings are filled with anti-friction metal. All wearing surfaces have proper provision to take up all loss motion, and are fitted with good oiling devices, etc. The gearing, being cast from cut wheel patterns, runs true, smooth, and wears well. Every part is fitted to the bed plates upon faced surfaces and secured by a superior quality of bolts, nuts and studs; steady pins are also used, and each engine can be entirely taken apart and replaced again in exact line by ordinary intelligence. The cylinders are fitted with Russia sheet iron jackets, drainage cocks, and a steam chest relief cock upon single engines for convenience in backing down heavy lifts, getting off center, etc. Lubricator upon steam pipe, and oil cups upon cross heads, are also supplied. Each engine is furnished with gipsy or winch head upon one end of drum shaft; also a flat faced band fly wheel upon crank shaft for any belt power duty required.

The boilers are large, and are made of the best brands of iron and tubes, lawfully stamped, tested, etc. They have all fixtures complete, specially made for the purpose, viz: Improved safety valve, steam gauges, water gauges, gauge cocks, stop, check, blow and throttle valves, three way exhaust cocks, to exhaust in or out of smoke stack, grates, fire-tight ash-pan, fire tools, smoke stack with cover, substantial cast-iron smoke-stack done on top of boiler, etc., complete. The pumps are of simple and reliable form. They are driven direct from the crank shaft by an eccentric and long connection; and are also provided with all drainage and air cocks for relief and cold weather uses. A suction valve and ten feet of suction hose are furnished with each engine. Between pumps and boilers on delivery pipes a check and stop-valve is used. This stop-valve is so arranged that if it is left shut off and the pump started to work, no accident or damage will happen to either pumps or feed pipe connections, as the force of the water will open this valve itself and pass into the boiler. By this device many breakdowns are prevented. The Berry & Place Machine Co., of this city, have recently accepted the agency of these hoisting engines for this coast. A number of styles are made, both of single and double cylinder. Some four styles are carried in stock here adapted for special work,



SINGLE CYLINDER LIDGERWOOD PORTABLE HOISTING ENGINE.

The Mineral Exhibit.

A creditable mineral display will be made at the State Mining Bureau this month, although the assistance it was hoped would be rendered was not by any means liberal. Only five counties in the State contributed money, mineral and cases for the separate county displays. These were Butte, Mono, Inyo, San Bernardino and Tuolumne. From Inyo county, particularly, came a very creditable and extensive lot of minerals. This is due, no doubt, to the constant reminders the Inyo *Independent* gave the people, and to the perseverance of Capt. J. M. Keeler, who greatly interested himself in the matter.

Aside from this, the amount collected from the public by the citizen's committee was insignificant, although Mr. J. Z. Davis, who has always been generous to the Mining Bureau, headed the list with $250, followed by Capt. McDonald with $50. But here the matter practically stopped. People who were asked to contribute to an exposition of minerals during the Conclave thought it was a matter for the State, and not for private individuals to carry out. This view was so prevalent that the idea of raising any suitable amount of money from the public has been practically abandoned.

The Mining Bureau funds were at a low ebb; and not withstanding the appropriation by the Legislature of $3000 per year, for two years, in addition to the income from taxes under the organic act, the State Mineralogist states that the expenses exceed the income. Therefore, the citizens' committee was appointed when it was proposed to get up the exposition.

It was hoped this committee would be able to relieve the Bureau, but it has not done so. Thanks to the three years' work already done, however, a good showing of minerals will be made, and the Bureau is now closed temporarily while preparations are going on.

Aside from the minerals which have been sent by the respective counties mentioned, a large number of miscellaneous minerals have been collected for this special exhibition. These counties have their own cases and minerals, the State Mineralogist taking care of and arranging the collections. We visited the Bureau this week and saw that a good display of minerals and ores would be made, though it is by no means as large as should be the case in the center of a mining region like this. Nothing but lack of money prevents a display that would do the State credit. We have plenty of minerals, but it takes time and labor to collect and arrange them.

The Los Angeles *Herald* says: The owners of the King mine, at Calico, held a meeting yesterday at the Calico Union, and the Oro Grande Mining Companies, Temple Block, and received the report of the President, Colonel Markham, of the operations of the company since the first of March last, when the mill commenced running on the King ore. The ore proved so rich that additional amalgamating pans were required, and were placed in position last month, so that the full capacity of the mill has not been obtained, except for the past month. However, it appears that after paying all expenses the company is in a fine condition, and yesterday declared a dividend of $16,000. The mill is now running on average ore, not selected for richness, and turns out $50,000 a month, with ten stamps, which is good enough for anybody.

CORRESPONDENCE.

Mines of Stockton Hill, Mohave County, Arizona.

EDITORS PRESS:—Having lately returned from visiting some of the most promising mines of this district, and knowing that the MINING AND SCIENTIFIC PRESS takes a lively interest in everything pertaining to the mining industry, and is looked upon as the most valuable medium of information in mining affairs, I will improve a leisure hour in dropping you a line. This, as most of your readers are undoubtedly aware, is an old district. Away back in the "60's," when this country was a *terra incognita*, and a trip into its mountain fastnesses was environed by every danger—the toilsome march across the trackless desert, in the face of desiccating winds that fanned the weary adventurer like a blast from the tweers of Hades; when to lose a canteen or miss a spring was to die, calling, like Dives, for one drop of water to cool the parched tongue; when every bowlder and every cluster of mesquite was liable to ambush a treacherous, merciless foe—a few hardy adventurers, crossing the country from California, and coming down from among the silver mines of Nevada, discovered unmistakable evidences of a prolific mineral-bearing section, and located the Wallapai mining district. Many of the original locators, after braving every danger, enduring every hardship, and having "sowed that others might reap," have sealed their devotion with their lives, and now sleep on its rocky hillsides. But their places have always been filled by others no less willing to stake their all on, and with no less faith in, the ultimate outcome of the district. I have long wished to visit this district, of which I have for years heard so much, and, coming down the A. & P. road a few days since, and finding myself at the embryo town of Kingman, within a few miles of Stockton Hill, I resolved to gratify myself, and have

A Look at its Mines.

A pleasant ride of some seven miles (per buckboard) up a gradual rise, and I found myself at the foot of the hill immediately below the little mining town of Stockton, and then a short walk of half a mile up a new grade just completed by Mr. Springer, of the "Cupel," and I am in Stockton, a veritable mining camp, scattered irregular, with no attempt at streets or corner lots, accommodating itself to the inequalities of the surface. We have seen its prototype on many a mountain side. The smug cabin behind the cedar, the inevitable forge, the spring in the gulch, and that invaluable but unappreciated quadruped, the burro, nipping the grass among the rocks, a-looking wistfully in at the cabin door for any stray morsel that might come its way. And here are

Bearded, Manly Men.

We have seen their prototypes before, men who have confronted dangers, combatted obstacles, battled with the forces of nature, until, vulcanized in the fires of experience, they have (perhaps unconsciously) become the true pioneers of our civilization. While in Kingman I met a gentleman acquainted in the country, and on inquiry was informed that, among the valuable properties of the districts, the cluster of mines owned by the Grey Bros. was, perhaps, the most conspicuous, and was advised to call on them on my arrival at Stockton. I also learned that the celebrated "Blue Bell" and "Miners' Hope," of which I heard flattering reports while in distant portions of the Territory, belonged to these gentlemen. On my arrival I lost no time in calling on them, and was agreeably surprised to find in them old Mexican acquaintances of whom I for years lost sight. I remember a Mr. Thom as a boy, as a Comstock miner of twenty years ago, and afterwards as a pioneer of Eureka and Pioche, and Mr. Robert Grey, as an experienced Nevada silver miner, associated with Mr. John B. McGee, in the White Pine days. These gentlemen kindly consented to escort me through the mines, and the following morning, accompanied by Mr. Thomas Grey, I started on

My First Day's Trip.

I will endeavor to give your readers the result as briefly and lucidly as possible. Our first visit was to the Cupel, a mine owned by Spranner, Scanly & Co., of your city, and under the management of Mr. Springer. At the present, no developments are being made, as Mr. Springer is actively engaged in timbering the main shaft, which is down some seventy feet, finishing his hoisting appliances, etc., preparatory to active operations in the near future. They have a fine house just erected for the accommodation of employes, a substantial building over shaft, stables, etc., and everything about the mine looks like business. Mr. Springer has had many obstacles to contend with, but is energetically overcoming them, and is evidently "the right man in the right place." There are old workings on this mine that we did not explore, among them a shaft 150 feet deep. I learn from disinterested parties, that under the old inconvenient mode of working, $150,000 have been extracted from this mine. We next visited the

Fountain Head,

A mine owned by the Grey Brothers. This mine is situated on the north side of the mountain, south from Cupel canyon, and one fourth of a mile due west from the Cupel mine. It is a fifteen hundred-feet location, with a general trend of northwest by southeast, and a slight westerly dip. The vein matter (gangue) of this mine is not less than twelve feet, and the ore vein, as shown in the two shafts, 1,000 feet apart, is three feet in width. Shaft No. 1, 200 feet from southerly bounds, is down thirty feet; and shaft No. 2, 800 feet northerly, is fifty-five feet in depth, the vein in one being almost a fac-simile of that in the other. The ore of this mine, of which there are some fifty tons on the dumps, carries about twenty-five per cent lead, and averages from actual working tests $40 per ton in silver, with a small percentage of gold. The Fountain Head is a contact vein, lying between granite and porphyry. At the northerly end of the mine, a fine spring of water has been developed. Going almost due west, and climbing the mountain some half mile, we come to the

Blue Bell,

Another mine owned by the Grey brothers. This is another immense ledge, boldly plowing the country rock, and cropping at intervals its its entire length (1,500 feet). This mine has considerable surface development, crosscutting, etc., plainly demonstrating that it is a monster in size, the vein matter being not less than twenty feet in width. Four hundred feet from the southerly boundary a shaft has been sunk sixty feet, all in ore. There are about fifty tons of ore on the dump of this shaft. One thousand feet northerly on the ledge from shaft 1 is shaft No. 2, twenty-five feet in depth. The ore vein in this shaft is about two and one-half feet in width, and there are some fifteen tons on the dump. The ore of the Blue Bell is a chloride, and averages about $75 in silver, with some $20 per ton in gold. Assorted ores from this mine have been reduced at distant reduction works (San Francisco, and Pueblo, Col.) that have reached much higher figures. The formation is the same as that of the Fountain Head—what miners call "friendly" rock, easily worked. A company owning this mine and a twenty-stamp mill in a convenient location need have no fears for its financial future.

The Charlotte,

A mine also owned by the Grey brothers, and situated about one mile in a southwesterly direction from the Blue Bell, and on the western slope of the range, near Todd basin, consists of two parallel veins, some seventy-five feet apart, within the boundaries of the location. The widest stratum is about ten and a half feet in width. The ore is a chloride, carrying no appreciable quantity of lead, and, assorted, averages about $175 per ton. This mine has been utilized by the Grey brothers as a "chloriding" mine, *i. e.*, a mine that could always be relied on for a "grub stake," as where a few hundred dollars could be extracted on short notice, to meet any financial emergency. Outside parties, to whom the mine has been leased, are at present engaged in working it, and a few days since shipped a carload of ore to Albuquerque, N. M. Leaving the Charlotte and following the trail almost due north, about a mile, we arrive at

The "Alpha."

This mine is owned by Messrs. Cole & Caffery, two energetic, practical miners. These men, instead of waiting for "something to turn up," are very busily engaged in turning up a very fine mine. They have at present in main working shaft attained a depth of 120 feet. The pay ore in shaft from surface down will average about three and one-half feet. Like other mines in vicinity, the gangue is very much wider. The Alpha produces some very high grade ores, assays of selected samples going into the thousands, the average of entire pay stratum going in the vicinity of $100 in silver with a respectable percentage in gold. Messrs. Cole & Caffery, while sinking main shafts, are extracting some ten tons per week, and are at present shipping their ores by A. & P. R. R. to Pueblo Col. I learn that my old friend, M. P. Collins, formerly of San Jose, is the fortunate owner of the extentions of the Alpha. Having taken a lunch with the Alpha boys, we pressed our way due north some half mile, and arrived at the

Silver Monster.

This ledge, as regards size, is appropriately named, and is indeed a monster. There are two prominent locations on the ledge, besides several extensions. The Cincinnati, owned by a syndicate of New York capitalists, known as the Fairfield and Cincinnati Company, and the Silver Monster, owned by the Grey Brothers. The Cincinnati, fifty feet from the line of Silver Monster, has a shaft 150 feet in depth. In this shaft three crosscuts have been to the hanging, one at a depth of fifty, one at the depth of 100, and one at the bottom of the shaft, all in ore. The Silver Monster has a shaft, thirty-five feet in depth, in ore. I would not attempt, even approximately, to give the width of this ledge; as its name indicates, it is a monster. The ores of this ledge, while of immense quantity, are of heavy galena, low grade, and undoubtedly of a refractory nature. Turning to the right, and following the comb of the mountain towards home a walk of half a mile brings us to what is usually conceded by all as being the finest prospective mine in Northern Arizona.

The Miner's Hope.

This is another ledge of immense size, the mineral formation being not less than twenty feet in width. It is situated on the crest of the mountain west of the Cupel, and crosses the summit obliquely, cropping boldly far down on either side. It has been opened by shaft, at about the center of the claim, to a depth of seventy feet. The pay vein, as shown, the entire depth of shaft, is three feet wide, and averages $90 per ton, in gold and silver, (under the old, expensive and inconvenient facilities for disposing of ores. Over $5,000 have been already realized from ores taken from this mine. The Miner's Hope is admirably situated in regard to working facilities, as it can be easily opened by tunnels or drifts running in on the ledge. This is certainly a most flattering prospect for a magnificent mine, and I think I hazard nothing in prophesying that in the near future, among the very first mines of the coast will be mentioned the Miner's Hope, of Stockton Hill, Mojave Co., Arizona. Descending the mountain, on the north side of Cupel canyon, as we near home we come to the

Pure Metal,

A vertical ledge, in the same formation as the others described, and holding the same general course. While having a big formation, the ore vein proper is of a width of about three feet, and is, as its name indicates, a vein of pure metal, running about eighty per cent in lead, and carrying about twenty-five dollars per ton in silver. New Mexican parties are at present negotiating for 1,000 tons of ore from the Pure Metal.

The Miners of Stockton Hill

Have, since the location of the district, labored under every discouragement and disadvantage incident to life in a mining camp isolated from the world as this has been. All the necessaries of life were to be had only at fabulous prices. Parties looking for mining properties were loth to undertake a journey fraught with so much inconvenience, not to say peril; and parties visiting the district were appalled at its isolation, and deterred from embarking in mining enterprises where such formidable obstacles presented themselves. Again, ores, in order to leave even a small margin of profit to the miners, must needs have been of fabulous richness. But the spirit of progress has smitten the desert with its iron wand, and everything is changed. The iron horse now shrieks at the foot of Stockton hill; provisions, powder, tools, machinery, and everything essential in the development of a mining district can now be had at prices ridiculously low, in comparison; lumber sawn from the mills of San Francisco mountains, can be delivered at a point seven miles from Stockton hill at a cost of about twenty-five dollars per thousand; coal from the mines of Gallup, N. M., at $10 per ton. While small quantities of ore are often found of fabulous richness, the great mass of the ores, as in every other district that any of us have ever visited, are what we have been used to call "low grade," is from $40 to $80 per ton. And certainly, what I have already seen satisfies me, beyond a doubt, that the quantity of this character of ore is practically, without limit. The character of the country rock vouches for the presence of an ample water supply, even ignoring Oak creek, within five miles of the principal mines. Any miner can see from the "friendly" character of the country rock, that mining will be comparatively inexpensive, and it requires no prophetic vision to see, in the near future, a brilliant prospect for the mines and miners of Stockton Hill.

C. C. B.

Oregon Nickel.

EDITORS PRESS:—Permit me to reply to Mr. Lovelock's article in your last issue. I am personally acquainted with Mr. Wm. S. Bell, part owner of the mines referred to, and showed him my results. He was so much pleased that he wished me to work some of his ore; and since then, his partner, Mr. Curtis of Oakland, has informed me that he expects to receive four hundred pounds for that purpose. Mr. Lovelock must know that a single smelting of Mr. Bell's ore would not produce metallic nickel, but speiss (nickel arsenide), which would have to undergo other treatments before metallic nickel could be obtained. No furnace of "peculiar design" would effect this result. If Mr. Lovelock will examine the "several bars of nickel smelted from the ore as taken from the ledge," he will find them to be speiss, not metallic nickel. Mr. Bell told me he had made a number of experiments, but had not succeeded in obtaining metallic nickel, except by reducing the oxide obtained by chemical treatment. He showed me a small button obtained in this way, which weighed a few grains. The ore from which I obtained the first bar of metallic nickel produced on this coast was garnierite from Oregon. This bar is now in possession of Edson Adams, Esq., of Oakland, the owner of the mine. I have a process especially adapted to nickel ores containing sulphur, arsenic and antimony, which I hope to prove to Messrs. Bell & Curtis to be the most economical and practical method for working their ore.

Yours respectfully,

GEO. J. ROCKWELL.

San Francisco, Cal., July 25, 1883.

NEW MILL STARTED UP.—On last Saturday morning the new mill lately completed on the Premium mine was started up for the first time. The mill machinery was made at the Greenville Iron Works, and is as thorough in finish as it is complete in detail. The owners of this mine are all working men. During the past five years they have patiently and steadily worked to develop their property. They did not attempt to build a mill till they had first satisfied themselves that there was ore enough to warrant such a step, and it is to be hoped that their most sanguine expectations may now be more than realized. A. A. McKenzie is amalgamator.—*Greenville Bulletin.*

Conveying Water to Mines.

In the Mint Director's report is a chapter on Nevada county, from which we take the following extract:

The water supply of the Eureka Lake and Yuba Canal Co. is the most extensive of any company in the State. It consists of a system of ditches aggregating in length about 200 miles, conveying the water from various sources of supply high up in the mountains; a series of storage reservoirs, three or four in number, located at an elevation of 6,000 feet above the sea level, holding and furnishing water during the summer months, when the supply of the streams is diminished or cut off; also a number of distributing reservoirs, so situated near the points of delivery that they may receive the water from the ditches, and distribute it as desired for use.

The principal and largest of the storage reservoirs is the Eureka, or French Lake, a natural lake across whose outlet a dam has been raised, producing a reservoir of large capacity. The next is the Faucherie, lying about 600 feet below, and about two miles from the Eureka. The third and fourth are the Weaver Lake reservoirs, which are situated on one of the tributaries of Middle Yuba.

Of all these reservoirs, the French is the most important. It was originally a mountain lake of great depth, and contained a large body of clear water. A substantial dam, built of blocks of granite, with a facing of plank, was constructed across its outlet in 1858–59. This dam is about 250 feet long from bank to bank of the gorge in which it is built. Its base, measured along the course of the stream, is 89 feet; its height 68½ feet above the foundation, and 62 feet above the bottom of the outlet, which is an arched sluiceway, traversing the structure, the discharge being regulated by gates. The area of the reservoir, when full, is about 337 acres, and its estimated capacity 661,000,000 cubic feet.

The Faucherie reservoir forms an area of 139 acres, with an estimated capacity of 170,000,000 cubic feet. The Weaver Lake reservoirs also have large capacities for storing water for use in the summer season. The aqueducts, consisting of ditches, flume, or pipe, aggregating in length more than 200 miles, are capable of delivering at various points 8,800 miner's inches in wet weather, or 4,600 in dry weather, each inch amounting in 24 hours to 2,260 cubic feet. This company also have 16 smaller or distributing reservoirs at various points along the ridge. The cost of these reservoirs and aqueducts cannot be accurately ascertained, but it does not fall short of $1,250,000.

The average annual expenses of the company's ditch and water property is about $85,000. Considerable pains have been taken to show the vast outlay of money in opening and equipping these large mining properties, owing to the fact that public attention in California has been drawn to them so largely in the past two or three years.

ANOTHER GIGANTIC MINING SCHEME.—There are at present in Oroville, our former Congressman, the genial John K. Luttrell, and the eminent engineer, A. W. Von Schmidt. This is the gentleman who built the dry dock at Hunter's Point, who blew up Blossom Rock, and who drove off the robbers who stopped the Oroville and Quincy stage some years since. These gentlemen are there in the interest of a huge mining scheme, which contemplates the turning of Feather river, the mining of its bed for several miles, the mining of Carpenter's Flat to its bedrock, which has never yet been favored, and the establishment of a vast water power, sufficient to turn all the manufacturing machinery in the State, and supply Marysville, Sacramento, Stockton, San Francisco and intermediate towns with water. That is, they can do all that if they can build a dam that will stand the flood pressure of the Feather river. We have not heard the opinion of Mr. Von Schmidt on the proposition; but as he is an eminent engineer who has been successful in all that he has undertaken, we should regard it as practical, however doubtful it may be about its proving profitable as a mining operation. A dam to hold the waters of the Feather river will cost a large sum, and the question to be considered is whether sufficient can be realized to render the work profitable, after the practicability of the work has been decided upon.—*Butte Record.*

NEW MINING DECISION.—The Secretary of the Interior has decided in the case of the Rob Roy mineral lode, Helena, Montana, that where two applications are made, one of which has been abandoned, the ground in question comes within the purview of the second application, and is subject thereto. Previous to this decision, it has been held by the Department, in case of the abandonment of the land in controversy, the abandoned tract should revert to the public domain. In the case of the "Bobtail vs. the Caledonia," in Whitewood Mining District, Deadwood, Dakota Territory, the Secretary decides that after the claimant has obtained a judgment in his favor in a court of competent jurisdiction, he is at liberty to take the necessary steps pointed out by the statute to obtain a patent. He need not wait until the time for claiming an appeal to a higher court has expired. He may proceed subject to being again stayed by appeal; but if the appeal is taken the steps which he had taken subsequent to the judgment toward obtaining a patent are held to be valid, if he be finally successful in the higher courts.

MECHANICAL PROGRESS.

Heated Bearings.

A writer in an Eastern mechanical jouurnal says: "After all the reasons and causes for heated bearings, I believe that if they can be kept clean and free from dirt and dust, there would be less heating of bearings than there is. A bearing may run for months and be kept nice and cool, and all at once take a notion to heat and bother, after a general waking up has taken place by the parting of one of the main belts, and then be set in order by just cleaning out the bearing by taking off the cap and washing with soft soap. To cool a bearing, water made a little soapy will do very well, and in many cases is just the thing, where the dripping will not interfere with the machinery or belting. The use of plumbago or lamp black in oil I never placed any implicit faith in. I like to have a bearing heat after the box has been rebabbitted, just enough to glaze its surface a little, for then it seldom ever troubles, if it only lives through the first heating without injury; otherwise take apart the bearing and scrape the surface till an even pressure is brought to bear, and then try again. I like this using a little oil at a time from an oil cup that contains an oil that has got some body to it, and after it has been worn out, to fall into the drip pan for that purpose. When there is danger from heating, a piece of beef's tallow can be laid in the cap to melt and run into the box when heated from this cause. In taking down and replacing shafting or machinery of any kind, if the bearings are first thoroughly cleaned, when replaced, nine times out of ten they will not trouble, even though their caps have been rescrewed down too hard, or the whole force brought to bear upon some particular spot. It is astonishing how, in some places, a bearing will run all its lifetime without any trouble in the least, and perhaps where the whole strain of the main belt is brought to bear, while at the loose end of another shaft they have had more or less trouble from the very first. The lathe man's work may, in this case, have something to do with it; the file, instead of the cold water finish, may have taken the work out of round, and left the surface to jump and pound, and cut the bearings out. Heated hearings from any of these causes can only be found by careful examination. Bring a rest as near the shaft as possible, and see if it remains the same distance from the surface while revolving. If it does, it is all right at this point; then test in the same way on the other side, to see if the shaft is both circular and straight. By means of a lever and a short bearing for its fulcrum, the looseness of the shaft in its bearing is determined, and its mechanical defects rectified."

How to Recognize Good Wood.

Rankine says that there are certain appearances characteristic of good wood, to what class soever it belongs. In the same species of wood that specimen will in general be the strongest and most durable which has grown the slowest, as shown by the narrowness of the annular rings. The cellular tissue, as seen in the medullary rays (when visible), should be hard and compact. The vascular or fibrous tissue should adhere firmly together, and should show no wooliness at a freshly cut surface; nor should it clog the teeth of the saw with loose fibers. If the wood is colored, darkness of color is in general a sign of strength and durability. The freshly cut surface of the wood should be firm and shining, and should have somewhat of a translucent appearance. In wood of a given species the heavy specimens are in general the stronger and the more lasting. Among the resinous woods, those having the least resin in their pores, and among non-resinous woods those which have least sap or gum in them, are in general the strongest and most lasting. Timber should be free from such blemishes as "clefts," or cracks radiating from the center; "cup shapes," or cracks which partially separate one layer from another, "upsets," where the fibers have been crippled by compression, "wind galls," or wounds in a layer of wood, which have been covered and concealed by the growth of subsequent layers over them, and hollow or spongy places in the center or elsewhere, indicating the commencement of decay. *Manufacturer and Builder.*

A One-Wheeled Buggy.

A Chicago man has invented a single-wheeled carriage. The vehicle has shafts which are so fastened to the horse that it can neither tip nor upset unless the animal should fall. The seat and box are behind the wheel. The advantage claimed for this novel contrivance is, that it can be hauled on any path wide enough to accommodate a horse. The plain inference is, that as it will carry a load, it would be an admirable substitute for the pack-mule on mountain trails, where greater speed can be obtained on the descending grade, with the driver borne along in comfort. The public will have greater or less confidence in the invention, as the case may be, after witnessing its performance.—*N. Y. Tribune.*

In reference to the above, the *Call* of the 18th inst. contains the following:

"Having seen an article in the *Call*, taken from the Chicago *Tribune*, in regard to a one-wheeled buggy, let me say that in February, 1881, I saw a one-wheeled buggy in Cambria, San Luis Obispo county, which the inventor called a horse velocipede. So I think that California can claim the honor, if such there is, of the invention. It had strong shafts, with such fastening as would prevent its being turned over, unless the horse was thrown down. The seat was placed directly over the wheel. For further particulars, address Mr. Ira Van Gordon, Cambria, San Luis Obispo county. I am yours, respectfully, D. S. VAN SLYKE."

Wider Steel Rails Needed.

Mr. Reuben Wells, master mechanic of the Louisville and Nashville railroad, at the recent Master Mechanics' meeting, at Chicago, expressed himself as follows:

As regards the wear of wheels and rails, it is a question whether a wider top to the rail would not add proportionately to the durability of these parts. Within a few years we have largely increased the weight on the wheels, in some cases nearly doubled it, but have not widened the rail, and, as a consequence, we find the wear of both has been increased proportionately. If the part of the tread that now projects beyond the rail could also have a bearing upon the rail and carry its proportion of the load, the durability of the wheel, as regards the natural wear of its face or tread, would be increased as much, perhaps, as twenty per cent, with a proportionate increase in the durability of the rail.

The best shape for the flange and tread of the wheel and for the inner edge of the rail are questions about which there is much diversity of opinion among those best informed on the subject. Scarcely any two wheel manufacturers make the same shape of the flange and face of the wheel precisely alike, and there is no equal variation in the curve lines of the edge of the rails against which the flanges have their bearing.

These matters, it seems to me, are of sufficient importance to warrant a thorough investigation. We ought to know whether any improvement can be made or whether the present variety is as good in practice as uniformity would be.

ALLOYS of metals are often difficult to make, and very small quantities greatly affect alloys. The presence of 1-30000th of a pound of antimony in a pound of melted lead increases the rapidity with which the lead oxidizes and burns. Lead which contains more than 1-14000th of its weight of copper is unfit for the manufacture of white lead. *Der Techniker* says gold with an alloy of 1-2000th of lead is extremely brittle. Copper with ½ per cent of iron has only 40 per cent of the electric conductivity of pure copper. Nickel was regarded as a metal which could be neither rolled, hammered nor welded, until it was found that the addition of 1-1000th of magnesium, or of 3-1000th of phosphorus, makes it malleable. Some varieties of east steel are exceedingly brittle, but the addition of 1-12th of 1 per cent of magnesium makes them malleable. At the Paris Exposition of 1878, a great difference was found in the toughness of sheets which were made of Swedish puddled iron. The only difference which chemical analysis showed was that the good plates contained 20-100000ths, and the bad 21-100000ths, of phosphorus.

YELLOW PINE, hard finished in oil, is the rival in beauty of any wood that grows, not excepting the costliest hardwoods. It is susceptible of receiving and maintaining as high a degree of polish as any wood with which we are familiar, and as to durability, when thoroughly impregnated with oil, it may be said to be almost everlasting. In such a condition it is impervious to even hot grease and other substances that leave an ineffaceable stain upon white pine, maple, and various other woods. Flooring for use under carpets should be largely sap, and when exposed either for inside or outside use, should be as near all heart as possible. For inside trimming, wainscoting or panel work, the curly variety, which, by the way, can only be obtained in limited quantities, and ought to bring from $60 to $80 per thousand in any market, instead of only half that sum—is, in the writer's estimation at least, superior to either cherry or bird's eye maple.—*N. W. Lumberman.*

THE Indianapolis Wooden-Dish Co. has just perfected a new machine for making wooden dishes. This machine takes the veneer from the veneer mill, cuts out the blank, shapes and scores it, folds it up, and takes the wire from the spools forming the staple, drives the staple at each end of the dish, drives and clinches it, and throws the dishes off from the machine complete, at the rate of sixty per minute. The works have a capacity for turning out 200,000 wooden dishes per day.

COMPLICATED MACHINES.—A writer in an Eastern journal says: "The tendency to complicate machines and make them universal, or machines of many kinds, is fast becoming extinct. It has been usually found to be a very much more costly way to produce work than with special machines made for one kind of work, or at least not many kinds of work, and then only when they were similar in their processes and manner of production and operation.

A JOURNAL BOX slightly out of line or level will absorb a large amount of oil, and yet be continually hot, waste power by unnecessary friction, besides grinding and cutting the shaft. It will always pay to attend closely to such matters.

SCIENTIFIC PROGRESS.

Phenomena Attending a Total Solar Eclipse.

Those not familiar with the problem which astronomers are at present endeavoring to solve, have doubtless wondered why it was that scientific expeditions should be fitted out at great expense and dispatched to the uttermost parts of the earth for the purpose of directing their instruments of precision for a few minutes at the spectacle of the moon concealing the sun, although it may be admitted that such a phenomenon is, in itself, exceedingly interesting.

But the astronomers see much more than an impressive spectacle in a total eclipse of the sun. They know that the intense brilliancy of the luminous body of the sun renders it impossible to make observations of, or to gain any knowledge of his surroundings, and that these surroundings, in the highest degree interesting and wonderful, are only rendered visible when the vast floods of light emitted by the sun are cut off by the interposition of the dark body of the moon. The astonishing character of the solar atmosphere then stands revealed to the eye of the astronomer.

When the moon comes exactly between the earth and the sun, the whole of the intensely brilliant body of the sun which we ordinarily see is cut off from our view; but projecting beyond the edges of the black circle formed by the moon, objects that might be taken for red flames are seen. These flames, protuberances or prominences, as they are variously called, rarely show any flame-like motion, but in most cases remain unchanged in shape, until the returning sunlight, as the moon passes on, blots them from view. They exhibit a great diversity of striking and curious forms, resembling various trees, clouds, horns, tongues of flame, etc.; and although they appear small when compared with the size of the sun, their actual size is enormous, some being 50,000 or even 100,000 miles high, and proportionally broad.

A close inspection shows that these singular prominences rise out of a scarlet ring of light surrounding the whole hidden sun. This fiery ring, which is in reality a section of a spherical shell around the sun, is called the "sierra." With the aid of the spectroscope, with which—in improved forms—it has been possible to reveal the red prominences even when there is no eclipse, and in full sunshine, it has been demonstrated that the sierra is composed of glowing gases, among which hydrogen predominates.

These protuberances are eruptions of heated gas projected from the body of the sun; and astronomers have occasionally been fortunate enough to witness geyser-like eruptions of these gaseous meteors in the very act of eruption, the red columns of gas streaming upwards to the prodigious height of 100,000 or 200,000 miles within a few minutes. While, however, the sierra and the protuberances may be observed with the aid of the spectroscope when there is no eclipse, it is during a total eclipse, and especially during one of long duration—like that lately observed at Caroline island—that these wonderful objects can be observed and studied to the best advantage.

Beyond the sierra, also, there are other singular objects which can only be seen during an eclipse. There is, for example, a zone of silvery light surrounding the hidden sun outside the red disk of glowing gases, and these, radiating out in all directions to astonishing distances—sometimes to the distance of six or eight times the apparent diameter of the sun, corresponding to an actual distance of several millions of miles—are the splendid rays of the corona. These are generally of a silvery hue, and taper off at their extremities, gradually growing fainter as they recede from the sun, and making a most striking spectacle in the darkened heavens.

What these rays may be, and what part they play in the economy of the sun, are still among the problems that have baffled science to determine. That they are governed by some law intimately connected with the condition of the solar orb itself, is shown by the fact that they vary in appearance according as they are seen in periods of sun-spot maxima and minima. They extend to the greatest distances, and present the most complex and interesting phenomena at the sun-spot maxima when the sun is racked and rent by internal forces. *Builder.*

Concerning Sanitary Science.

The New York *Star*, in an able editorial, makes some assertions which must be startling to members of the profession who have been taking a Rip-Van-Winkle sleep during the last generation or two. We quote a few paragraphs: "One of the marked changes of our time is the altered position of the physician in the community. The traditional duty of the doctor is to cure disease, and disease was supposed to be a sort of malignant entity which had got into the system and could be expelled only by the most energetic and heroic remedies. Physicians were said to belong to the medical profession, as the chief business of the doctor was to prescribe medicines, which were mostly drugs. And Voltaire wittily summarized the work of the physician as an attempt to work a miracle by reconciling intemperance and health. A half century has altered the whole scope of medical study. Sanitary science profoundly affects medical theories. And the upshot of it all is that the old faith in drugs and medicines of all kinds is fast dissolving. People are everywhere learning that sunlight, pure air, good food, a proper dress, regular habits, plenty of sleep—in short, that right living is a million times better than all the medicines of the world.

"The great physicians of our times are vastly more interested in sanitary science and hygiene than in therapeutics. They are studying anew the questions pertaining to life. They are investigating the conditions of perfect physical existence. They are giving lectures and writing books on the great art of keeping well, of developing physical force, of building up a perfect body. The questions of drainage and ventilation, of the nutritive values of the different kinds of food and the proper methods of cooking, of artificial exercise when it is necessary to resort to such expedients, the heating of houses, and the quantity and fashion of clothes that should be worn—are assuming an importance hitherto unknown. Everything that relates to the art of living so as to avoid sickness and pain, and maintain the highest degree of power and enjoyment, is invested with new importance. The physician is no longer a medicine man. We send for him when ill, it is true, and value his curative services as highly as ever; but we would pay him a double fee to keep us well. He is a member of a health police, whose function it is to keep people from getting sick and hold disease at bay. And instead of killing a doctor when a patient dies, after the manner of the Emperor of China, the skill and proficiency of the physician of the future will be determined by his success in keeping his patients strong and well; and should they fall ill, he may be dismissed for a better one."

THE object glass for the great refracting telescope intended for the Russian observatory of Pulkowa, has been finished by the Messrs. Clark, of Cambridge, Mass., and is the largest glass thus far constructed. The order for the glass was given in 1881 by Prof. Struve, the director of the observatory, who has lately visited this country for the purpose of subjecting the glass to certain tests of its quality. These, it is said, proved to be in every way satisfactory, and the object glass is by this time on its way to its ultimate destination, if, indeed, it has not already arrived there. This great object glass is thirty inches in diameter. Pulkowa, however, will not be able to claim very long the distinction of having the largest refracting telescope in the world, for the great Lick telescope for California will have an object glass of thirty-six inches diameter, or six inches greater. Six inches appears a small addition, but it represents an enormous increase in power, for the light-gathering area of the Lick object glass will be to that of Pulkowa as 1,296 to 900, or forty per cent greater. The rough disk of the flint portion of the Lick glass has already been received by the Clarks, and they are at work upon it. It will be several years before it is finished.

THE KNOWN AND THE UNKNOWN.—The opinion is commonly expressed by those who are not well informed, that the world is so rapidly advancing in scientific discovery that a few years more of such extraordinary advancement as we have witnessed during the past quarter of a century, will practically exhaust the sources of discovery, and the scientist will sigh in vain for "new worlds to conquer." No opinion could, in reality, be more delusive than this. Each fresh discovery which discloses a secret that nature has so long and carefully guarded, illuminates with its feeble rays a background of other mysteries still unsolved, and so far from narrowing the field of discovery, widens the circle of the unknown and places its horizon still further off. He who thinks he has mastered a science is a superficial thinker. The profound thinker is he, who, having possessed himself of all the knowledge of his predecessors, perceives how little the sum of that knowledge is, in comparison with what still remains to be learned.

AMERICAN ASSOCIATION FOR ADVANCEMENT OF SCIENCE.—The thirty-second meeting of the American Association for the Advancement of Science will be held at Minneapolis, Minn., beginning August 15th, and closing August 21st next. Prof. C. A. Young, of Princeton, will preside. Information regarding transportation may be obtained by addressing Thos. Lowry, Esq., Minneapolis, Minn. All matters relating to membership, the presentation of papers, and business to come before the meeting will be attended to by F. W. Putnam, permanent Secretary, who may be addressed at Salem, Mass., up to August 8th, and afterward up to the close of the meeting, August 21st, at the Nicollet house, Minneapolis, Minn.

THE EARTH MORE RIGID THAN STEEL.—Prof. Sir W. Thomson, in his new treatise on natural philosophy, is led, by a consideration of the necessary order of cooling and consolidation of the earth, to infer that the interior of our world is not, as commonly supposed, all liquid, with a thin, solid crust of from 20 to 100 miles thick, but that it is on the whole more rigid than a continuous solid globe of glass of the same diameter, and probably more rigid than such a globe of steel.

THE Volta prize of $6,000 will be awarded by the Academy of Sciences, Paris, in December, 1887, under the decree of June 11, 1882, for the discovery or invention of whatever shall render electricity applicable economically to one of the following objects: Heat, light, chemical action, mechanical force, the transmission of messages, or the treatment of sick persons.

MINING SHAREHOLDERS' DIRECTORY.

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Albion Con M Co	Nevada..	14..	50..	July 17..	Aug 20....	Sept 8...	A W Havens	309 Montgomery st
Chollar M Co	Nevada..	12..	1.00..	Aug 2..	Sept 6...	Sept 28..	W E Dean	309 Montgomery st
Con Virginia M Co	Nevada..	19..	20..	July 11..	Aug 15....	Sept 5..	A W Havens	309 Montgomery st
California M Co	Nevada..	8..	20..	June 26..	Aug 4....	Sept 3..	C P Gordon	309 Montgomery st
Caledonia M Co	Nevada..	39..	20..	June 15..	July 19....	Aug 9..	R Wegener	414 California st
Eureka Con M Co	Nevada..	5..	1.00.	July 26..	Aug 27....	Sept 17..	P Jacobns	309 Montgomery st
Excelsior D G M Co	California..	22..	40..	June 16..	July 25....	Aug 10..	T J Watson	114 Davis st
Excelsior D G M Co	California..	1..	5.00.	June 5..	July 9....	July 26..	W. Cunningham	326 Montgomery st
Exchequer M Co	Nevada..	19..	20..	June 14..	July 19....	Aug 9..	C E Elliott	327 Pine st
Grand Prize M Co	Nevada..	14..	25..	June 25..	July 27....	Aug 20..	E M Hall	327 Pine st
Gould & Curry M Co	Nevada..	45..	50..	June 15..	July 20....	Aug 13..	A K Durbrow	309 Montgomery st
Holmes M Co	Nevada..	7..	50..	June 27..	July 30....	Aug 21..	C T Bridge	224 California st
Justice M Co	Nevada..	39..	10..	July 9..	Aug 13....	Sept 3..	R E Kelly	419 California st
Mexican M Co	Nevada..	23..	50..	July 17..	Aug 22....	Sept 11..	C L McCoy	309 Montgomery st
Martin White M Co	Nevada..	15..	25..	July 9..	July 11....	Aug 8..	J J Scoville	309 Montgomery st
Ophir M Co	Nevada..	45..	1.00.	July 26..	Aug 31....	Sept 20..	C L McCoy	309 Montgomery st
Savage M Co	Nevada..	56..	50..	July 16..	Aug 21....	Sept 10..	E B Holmes	309 Montgomery st
Tip Top M Co	Arizona..	6..	75..	May 29..	July 6....	July 28..	B Deus	309 Montgomery st
Union Con M Co	Nevada..	23..	50..	July 17..	Aug 20....	Sept 11..	J M Buffington	309 California st
Utah S M Co	Nevada..	45..	1.00.	July 20..	Aug 27....	Sept 14..	G C Pratt	309 Montgomery st
Virginia Con M Co	California..	10..	01..	July 24..	Sept 3....	Sept 24..	A F Benard	364 Howard st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Alexander M Co	Nevada..	2..	1.00..	June 20..	Aug 6....	Aug 27..	J K Warren	307 Montgomery st
Bald Mountain M Co	California..	2..	3..	June 26..	July 27....	Aug 30..	L Shannahan	125 First st
Champion M Co	California..	12..	10..	June 4..	July 31....	Aug 11..	T Wetzel	522 Montgomery st
Como Eureka G and S M Co	Nevada..	1..	25..	July 23..	Aug 29....	Sept 18..	L Hermann	220 Sansome st
Eintracht G M Co	California..	12..	05..	June 12..	Aug 8....	Aug 27..	H Kunz	209 Sansome st
Excelsior Water and M Co	California..	5..	60..	July 6..	Aug 11....	Sept 3..	W J Stewart	215 Sansome st
Equitable M Co	Utah..	28..	25..	July 24..	Aug 31....	Sept 23..	C J Collins	522 Montgomery st
Genesee M Co	California..	1..	40..	June 20..	July 30....	Aug 22..	J Seelfeld	419 California st
Hazard Gravel M Co	California..	7..	15..	June 20..	Aug 16....	Sept 4..	J T McGeoghegan	318 Pine st
Homeward-bound M Co	California..	2..	25..	July 23..	Aug 27....	Sept 10..	A S Bowie	314 Montgomery st
Lima Con M Co	Arizona..	6..	05..	June 11..	July 18....	Aug 6..	R D Hopkins	436 Montgomery st
Pacific M & Reducing Co	California..	1..	25..	June 20..	July 25....	Aug 15..	J W Bevillug	413 California st
Pittsburg M Co	California..	16..	10..	July 24..	Aug 28....	Sept 18..	R Wegener	414 California st
Roma Union M Co	Nevada..	2..	02..	June 18..	Aug 6....	Aug 27..	F. X. Simon	518 Sansome st
Swansea M Co	California..	3..	25..	July 21..	Sept 1....	Sept 24..	M A Wheeler	119 Market st
Seaton G M Co	California..	3..	8..	July 31..	Sept 5....	Sept 27..	A Martin	525 California st
West Branch Feather River M Co	Cal..	1..	01..	July 16..	Aug 20....	Sept 10..	A B Paul	328 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Alta S M Co	Nevada..	Wm H Watson	302 Montgomery st	Annual	Aug 16
Champion M Co	California..	B Burris	309 Montgomery st	Annual	July 30
Derbec Blue Gravel M Co	California..	Theo Wetzel	522 Montgomery st	Annual	Aug 7
Julia Con M Co	Nevada..	H C Charles	419 California st	Annual	Aug 8
Liberty Hill Con M Co		F E Luty	330 Pine st	Annual	Aug 6
Mayflower Gravel M Co	California..	J Morizio	328 Montgomery st	Annual	July 26
Martin White M Co	Nevada..	J J Scoville	309 Montgomery st	Annual	Aug 16
Navajo M Co	Nevada..	J W Pew	310 Pine st	Annual	Aug 14
Occidental M Co	Nevada..	A K Durbrow	309 Montgomery st	Annual	Aug 13
New York Hill M Co	California..	J B Leighton	527 Clay st	Annual	July 30
Red Hill Hydraulic M Co	California..	E Hestres	328 Montgomery st	Annual	Aug 9
South Feather Water & U M Co	California..	A J Halsey	328 Montgomery st	Annual	Aug 13

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Bulwer Con M Co	California..	W Willis	309 Moutgomery st	15	July 2
Kentuck M Co	Nevada..	J W Pew	310 Pine st	10	July 19
Navajo M Co	Nevada..	J W Pew	310 Pine st	25	May 14
Silver King M Co	Arizona..	J Nash	315 California st	25	July 12
Standard Con M Co	California..	Wm Willis	309 Montgomery st	25	June 12

Table of Highest and Lowest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING July 12.		WEEK ENDING July 19.		WEEK ENDING July 26.		WEEK ENDING Aug. 1.	
Alpha	1.50	2 00	2.00	2.30	1.90	2.00	1.80	2 00
Alta	.75	1.00	.85	.75	.60	.70	.65	.70
Andes	.45	.50	....	.45	.40	.75	.35	.70
Albion	.40	.50	.35	.40	....	.35	....	.35
Argenta	.05	.10	....	.05	.05	.50	....	....
Atlas	....	....	....	....	....	....	....	....
Belcher	1.15	1.25	1.20	1.25	.85	1.15	.80	1.00
Belding	....	....	....	....	....	....	....	....
Best & Belcher	4.25	4.45	4.15	4.40	4.00	4.30	3.75	4.30
Bullion	....	.85	....	.85	.75	.80	.70	.80
Bechtel	....	....	....	....	....	....	....	....
Bodie Isle	....	.45	.35	.45	....	.35	....	.40
Bodie Con	....	.80	.60	.80	....	.65	.65	.70
Bouton	....	.25	.15	.20	.15	.20	....	.15
Bodie Tunnel	....	....	....	.30	....	....	....	....
Caledonia	....	.05	.5	.25	....	.25	....	.25
California	.10	.15	.10	.15	.05	.15	.25	.40
Challenge	....	....	....	....	....	....	....	.30
Chollar	3.30	3.75	3.35	3.50	3.50	3.85	2 90	3.30
Confidence	2.05	2.25	2.00	2.15	1.65	1.75	1.55	2.00
Con. Imperial	....	.10	....	....	....	.10	....	.05
Con. Virginia	.40	.50	.35	.55	.35	.40	.30	.40
Crown Point	1.40	1.45	1.30	1.45	.85	1.10	.80	1.10
Dey	....	.55	....	.50	....	.50	.35	.55
Elko Con	....	....	....	.25	....	....	....	.25
Eureka Con	4.75	6.00	4.50	5.00	4.75	5 00	4.80	6.00
Eureka Tunnel	....	.60	....	....	....	.50	.50	.55
Exchequer	.20	.25	.20	.50	.40	.50	.40	.50
Grand Prize	....	.05	....	.05	....	.05	....	....
Gould & Curry	2 10	2.50	2.40	3.00	2.80	3 05	2.55	3.15
Hale & Norcross	5⅞	6¼	6¼	6⅝	6.75	7.00	6.00	6.50
Holmes	....	....	....	....	....	....	....	....
Independence	....	.60	....	.50	....	.50	.45	.50
Julia	....	.15	....	....	....	....	....	....
Justice	.20	.30	.25	....	....	....	.10	.15
Jackson	....	.35	....	.50	....	....	....	....
Kentuck	....	....	....	2.60	....	....	....	....
Martin White	....	.05	....	....	....	.25	.20	.25
Mono	....	....	....	....	2.80	2 95	....	....
Mexican	2.90	3.15	2.90	2.95	....	....	2.80	3.25
Mt. Diablo	4.50	6.00	5.00	5.50	....	5.50	5.00	5.50
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	....	....	....	....	....	....	....	....
Northern Belle	6¼	7.00	....	....	6.75	7.90	6.75	7.25
North Noonday	....	....	....	....	....	....	....	....
Navajo	2.40	3.20	2.85	3.10	3.05	3.40	3.10	3.25
North Belle Isle	....	.30	....	.35	....	.40	....	.40
Occidental	....	....	....	1.50	....	1.75	1.70	1.75
Ophir	2.40	2.65	2.30	2.55	2.40	2.70	2.40	5.00
Overman	....	.40	.30	.35	....	.35	.30	.40
Opo	....	....	....	....	....	....	....	....
Potosi	1.35	1.55	1.50	1.70	1.40	1.60	1.10	1.40
Pinal Con	....	.60	....	.65	....	....	....	....
Savage	1.95	2.05	2.10	2.45	2.25	2.40	1.80	2.20
Seg. Belcher	....	3.00	....	....	2.0	3.00	....	3.00
Sierra Nevada	3.90	4.45	3.65	4.10	3.80	4.35	3.85	4.25
Silver Hill	....	....	....	....	....	....	....	....
Silver King	8.50	9.75	6¼	6⅝	....	....	....	6.50
Scorpion	.60	.70	.55	.65	.60	.65	.60	.90
Tuscarora	....	....	....	....	....	....	....	....
Union Con	4.90	5¼	4.40	4.95	4.80	5¼	4.70	5.00
Utah	2.65	2.85	2.40	2.75	2.30	2.50	2.20	2.25
Ward	....	....	....	....	....	....	....	....
Wales	....	....	....	....	....	....	....	....
Yellow Jacket	3.75	4.05	3.75	4 00	2.75	3.50	2.80	3.05

A TERRIBLE earthquake shock occurred at Oporto, Italy, July 31st. Buildings were destroyed, and many thousands of lives are reported lost. One thousand are dead at Lucco, 1,000 at Fario, and 2,500 at Casamacciola. The damage to property is two million lire. Fifteen hundred tons of chloride of lime was used at Casamacciola during the day for deodorizing purposes, but the stench in the upper town is still unbearable.

THE extensive stables belonging to the Gordon House were burned to-day, July 31st, and two celebrated trotting horses, General Bramish and Highton, Jr., with several other valuable animals, perished; loss $15,000.

Sales at San Francisco Stock Exchange

THURSDAY A. M., Aug. 2.

450	Alta	65@70	
260	Andes	70	
200	B. & Belcher	4.20	
300	Belcher	1	
50	Bullion	80	
275	Chollar	3.10@3.13	
50	Crown Point	1.03	
975	California	40@45	
50	Confidence	2	
200	Challenge	25@30	
180	Caledonia	25	
1575	Con. Virginia	40	
15	Eureka Con	5⅞	
220	Gould & Curry	3@3.05	
880	Hale & Nor	6⅛@6⅜	
400	Mexican	3.20@3⅛	
100	Navajo	3.10	
50	Northern Belle	7	
2755	Ophir	4⅛@4 60	
20	Overman	40	
100	Potosi	1.30	
200	Savage	2.10	
350	Sierra Nevada	4.15@4 20	
300	Senator	20	
20	Silver King	6⅛	
10	Utah	2.40	
100	Union	5	

AFTERNOON SESSION.

200	Albion	35
100	Alpha	1.90
50	Andes	70
20	Belcher	90
300	Belle Isle	40
200	Bodie Con	75
100	Bullion	80
20	B. & Belcher	4.05
320	Chollar	3⅛@3.30
375	Con. Virginia	35@40
60	Crown Point	1.10
50	Challenge	30
400	California	35@40
40	Exchequer	50
520	Gould & Curry	2.95@3.05
160	Hale & Nor	6⅜
740	Mexican	3@3.10
100	Navajo	3.25
3945	Ophir	3.60@3.80
20	Overman	30
550	Potosi	1⅛
200	Savage	2.10
200	Senator	20
100	Union Con	4.95
30	Yellow Jacket	3.05

Mining Share Market.

The fluctuations in stocks during the week have been small. People seem to be awaiting developments, so the market is not a busy one. The brokers try to make a market, no doubt, but with small success of late. Up on the Comstock matters are going on as usual. At the Mexican they will soon make the connection between the upraise from the 2900 and the winze down from the 2700 level. They will then be able to explore the ore vein found above in the winze. The work of repairing the Central tunnel and the old Mexican shaft will now soon be completed, when a great amount of low grade ore may be cheaply extracted from the old upper works. Drifting has for a time been suspended on the 2500 level of the Best and Belcher and Gould and Curry. Some of the drifts are going into wet ground. At the Alta they are getting things in shape for pumping out the lower levels. This will require three or four months. The water now stands at the 1100 level, and between that and the 2150—the lowest level—there are at points some very long drifts; besides, the ground is about as thoroughly saturated with water as when the mine was first opened. By turning the water from the ranches up toward the head of the Carson river sufficient water will be obtained to run the mills to their full capacity. Thus all the miners may resume work and all go on as usual in the Yellow Jacket, Kentuck, Crown Point, Belcher and all the other mines.

Bullion Shipments.

Mt. Diablo, 23d, $7,628; Alhambra, 25th, $11,524; Northern Belle, 26th, $4,102; Bodie, 30th, $2,261; Standard, 30th, $14,004; Northern Belle, 30th, $7,369; Contention, 27th, $13,631; Crescent, 28th, $6,560; Horn Silver, 28th, $2,000; Horn Silver, 29th, $18,000.

CHOLERA is still raging at Alexandria. Eight deaths were reported July 31st.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Alpine.

STELLA.—*Monitor-Argus*, July 20: The ore in the Stella mine, in Mogul district is improving as depth is attained. A portion is said to contain a a considerable amount of lead. The value of ore now taken out ranges from $100 to $300 per ton.

Amador.

INDIAN DIGGINGS.—*Ledger*, July 21: The working of the hydraulic mines of this vicinity will soon be brought to a close, as the water is drying up very fast. Hale and the Baughman Brothers will soon make a clean-up. Their claim is run day and night. The Oneto owned by Oliver Ball is running full blast. Charles Estey will soon go to drifting in his claim. Mr. Edner, of Brownsville, is getting some good pay dirt from his mine, and several other mines near Brownsville are paying handsomely.

SUTTER CREEK.—A large number of hands were discharged from the Mahoney on Saturday. Between 20 and 30 men are now employed in and about the mine. The cause of this reduction of the working force is that the rock from the open cut did not pay, and work there has been abandoned. A few stamps of the mill are now running on ore from the mine proper, and the rock is said to be of paying grade. At the Mahoney, the rock at the 900 level is getting more plentiful, and the upper levels also are looking favorable. The mill is now in fine condition. In a few days the dump will be full of ore, and the 40 stamps will be started. Sinking at the Con. Amador is progressing. A depth of 200 ft has been completed, leaving about 100 ft more to sink, when drifting will be in order.

OLETA.—The miners will go to drifting as soon as the water is shut off, and their claims—most of them at least—will pay a better profit. The miners are paying a heavy price for water to run their claims, 7½ cents per inch for a continuous head of water, and 12½ cents per inch for water to wash up drift dirt.

MAMMOTH.—All the machinery for the extensive tunnelling operations from the Mokelumne river is on the ground. The yield of the Yellowstone last month was largely in excess of any clean-up for many months past—about $30,000. The Bunker Hill last month yielded considerable over expenses. The second clean-up of the Loyal Lead was about $3,000—better than the first.

Calaveras.

WEST POINT.—*Chronicle*, July 28: Times are brightening up here and the prospects look encouraging. Our local blacksmith is kept busy repairing mining tools and machinery. All our teams and teamsters are engaged hauling ore to the crushing mills. The Valentine Co. have purchased the machinery from the Carlton. The Holmes' gravel claim, situated on the other side of the Mokelumne river, four miles from here, are running a bedrock tunnel for gravel. Lowery & Crockett, on Mill Creek, have struck a bonanza in their gravel claim. The gold is very coarse, averaging from 10 cents to $20 a chunk. Andrew Smith has commenced hauling rock to the Carson mill for McGee & Brown. The rock is said to average from $50 to $60 per ton. It is reported that extraordinary rich rock is being taken out of the Old Texas claim, on the Mokelumne river below the Lone Star. Davidson & McDonald are the principal owners. Mr. Desmond struck a body of ore in the Ohio Con. formerly known as the Woodhouse mine, which assays $1,000 per ton. So we are informed by responsible parties.

SKULL FLAT.—The Star of the West Company are negotiating with parties to put up a large quartz mill on their mine at Skull Flat. The ore is reported very rich, averaging from $100 to $150 per ton.

El Dorado.

ARMSTRONG AND ROBERTS.—*Democrat*, July 28: In cross drifts of about 300 ft on the main channel, the gravel that they took out of the bottom of the drift paid from $3 to $7 per day to the man. Near the mouth of this drift, in the bottom of the main tunnel, $15 were recently panned out of three panfuls of gravel. In all they have 650 ft in length of this channel on their ground. All this proves that there is more gold in old El Dorado than has ever been taken out. There are channels here to-day that are as rich as any worked in old times. They are not so easily got at it is true; sometimes they are covered with a lava cap 90 to 100 ft thick.

RICH STRIKE.—In the Morrell Con. mine, on the Cederberg belt, near Greenwood, a narrow vein of exceedingly rich ore was discovered about two weeks ago. This has been followed since in both the upper and lower tunnel, until a vein 18 inches wide has been developed, of ore that is considered reliable for at least $1000 per ton. Some of the men also worked on the old Cederberg at the time of the $50,000 strike and they pronounce the indications in this case better than at any stage in the development of the Cederberg. They have put up a rotary six-stamp mill near the mouth of the main tunnel.

THE SPRINGFIELD.—The new hoisting-works are being put up as rapidly as is compatible with the great weight of the timbers and machinery. The foundations are of the most substantial character, and the new works when completed will be the finest ever erected in this county.

ONION VALLEY.—Monday and Badger have struck a quartz vein in their claim, which prospects from $500 to $750 per ton. Jerry Saucerman is working a gulch a short distance west of the valley, which he bought about a year ago for $75. Last season he took out between $600 and $700, and this season he is doing even better, having taken out several nuggets weighing from $4 to $11.

Kern.

KERNVILLE.—*Californian*, July 28: The Big Blue Lead, owned by the Summer, will soon develop into one of the great bonanza mines of this coast. Hitherto the work of extracting ore has been conducted near the surface, the expensive work of pumping being desirable to avoid; but in the meantime a tunnel for drainage and other purposes was started from the river. This has recently been completed striking the vein 200 ft below water level leading into the river a constant stream of 40 inches of water and leaving, above it, a vast mass of ore 60 ft in width, some of it very rich. The tunnel also drains several smaller veins lying to the west of the Big Blue and nearly parallel with it. On one of these, Lady Belle, work is actively prosecuted and great quantities of rich ore brought to the surface. It is claimed that in one part a hundred tons of ore is in sight that pays at the rate of $400 per ton.

Mariposa.

THE FREMONT GRANT.—*Herald*, July 27: From Bear Valley to the Benton mills, little is to be seen save the dumps of the various mines and tunnels with locked doors. An air of desolation and decay pervaded the entire hill. Cars, machinery, track-iron, and other expensive and necessary articles for mining purposes, were scattered promiscuously around to rust, rot, and fall to pieces.

Modoc.

HAYDEN HILL.—Adin *Argus*, July 26: On Wednesday, the 18th, another rich strike was made in the Juniper mine, Hayden Hill. The new strike is on the 90 level, and is also tapped on the 60 level. The vein is 15 inches wide. A large amount of dirt will, it is reported, yield $5 to the pound. It is stated that one man is getting out $2,000 per day. Very rich dirt has been found in this mine heretofore, but what makes the present strike so valuable is the extent as well as the richness of the lead. Juniper mine has heretofore been valued at $600,000 but that would not approach toward buying it to-day. But Juniper is not alone. Harbert Bros. in running a crosscut from their main shaft, 135 ft below the surface, have struck an extensive body of ore which runs from $25 to $40 per ton. They are putting their quartz mill in order preparatory to making a run. The Golden Eagle mine, Hopkins, Nash & Co. proprietors, has also struck a ledge three ft wide, with well defined walls. Among other names we hear mentioned in connection with the present "boom" at Hayden Hill, are Richie & Dunbar. They have taken out from 50 to 60 tons of fine ore, and are milling the same at the Hocs mill.

Mono.

STANDARD CON.—Bodie *Free Press*, July 25: During the week ending July 21st there was shipped to the mills 1452 tons of ore; received 1935 ounces of crude bullion and shipped to the company $14,316. The east crosscut, 1200 level, is in 400 ft. The progress during the week, 22 ft.

BODIE CON.—During the week 135.135 tons of ore was sent to the mill, and 147 tons crushed. The shipment of bullion amounts to $3,140.30. During the week ending July 21st the west crosscut from the north drift, 700 level, was advanced 11 ft; total length 359 ft. The ground is very hard.

NOTES.—Homer *Index*, July 21: The Summers mill at Sweetwater is crushing 13 tons of ore per day, the ore being chiefly from the bottom of the winze, over 500 ft beneath the surface, and it gives the average yield of $127 to the ton. The furnace of the Detroit Copper Co. in Jordan district is running steadily. Paul Rouze is packing good ore from the Rocky Point and Gold Band mines to his Lake canyon arastra. Erwin and Drew are taking some rich ore from the Clifton mine and having it packed to the Hearne arastra below Lake Lundy. The Gorilla mine, tramway and reduction works are being run steadily, and everything is working smoothly. The high mountains of Tioga district are alive with prospectors.

GREGORY FLAT.—Aurora *Herald*, July 21: The Silver Hill mill, was started up this morning. The machinery has all been overhauled and put in first-class condition. Considerable ore is on hand.

Nevada.

LONE TREE.—*Tidings:* The recent strikes in the Hartery and the Perrin, have given stimulus to the mining interests, and shortly the Con. Lone Tree will resume work. The property is at Forest Springs and is a location of 3,000 ft, embracing three separate ledges, one of them 2½ ft thick, and the others averaging eight inches. Pan washings yielded from $2.50 to $15 to the pan, and much of the gold was in large lumps. About $9,000 have already been expended on the property.

NEVADA CITY.—*Transcript*, July 29: A couple of days ago another bunch of specimen ore was found in the 600 level of the Nevada City mine. The pieces taken out so far are very rich in free gold.

NOTES.—*Mountain Echo* July 25: The Gold Hill mine is still turning out gold in abundance. The Confidence mill is nearly ready for operation. The forty stamp mill in course of construction at Carson's is nearly completed. The reports from Murphy's regarding the mining interest in that section have not been more flattering for years. Work is progressing on the Lindsay mine, the shaft being one hundred ft deep. A Mexican, while on his way from Vallecito a couple of weeks ago, found a chispa near Seven-pound Gulch, valued at $56. The Black Oak mine, owned by Wm. Osborn, and located 2½ miles northwest of Angels, is being worked and the lead is becoming richer. The Uno mine, in Nassau Valley, worked by Sylvester & Co., is looking well. The shaft is 40 ft deep, and the vein two ft in width. The average yield of the ore is $15 per ton. Work is progressing rapidly in the Marshall mine. The shaft has reached a depth of two hundred ft. The machinery recently erected on the Porter mine, works splendidly. The ore body is nearly fifty feet in width, the richer part however, being only about ten feet.

San Bernardino.

LAVA BEDS.—Calico *Print*, July 21: The Meteor is being opened by a tunnel and is looking splendid. The Morning Star has a tunnel in 75 ft and a shaft is being sunk from the croppings to connect with it. Some fine ore has been taken out of the ledge. Mr. J. H. Roberts suspends the work. The Mammoth Chief, is showing up excellently. A shaft has been sunk 35 ft, which is uncovering a broad vein of ore that is getting wider.

BLACKFOOT.—Work is progressing with favorable results. An incline shaft has been sunk twenty-four feet, in the center of an open cut fifty feet in length. It is estimated that the body of ore is at least 100 ft wide. About ten tons have been shipped to San Francisco, and there are fifteen tons on the dump.

BISMARK.—Work is progressing with a small force of men. The ore taken out recently is richer than usual. Last Monday twenty tons were crushed at the Oriental mill. There is a good deal of ore in sight.

San Diego.

COPPER.—Los Angeles *Times*, July 21: Mr.

Cheesebrough has some specimens from a mine sixteen miles from Yuma, on the California side, and only three miles from the railroad. The specimens are rich in copper and horn silver, with some free gold, an assay showing the following result to the ton: Copper, 45 per cent.; silver, fifty-seven ounces; gold, $10. The above may be considered a fair average of the ledge. The ledge is from four to six feet wide and well defined.

Shasta.

IGO. Cor. *Courier*, July 28: The South Fork arastras are all running on very fair ore. The Hardscrabble mine has suspended work for this season. They had a good clean-up. Quite a number of the Chinamen who were at work on the railroad have returned and gone to mining again.

Sierra.

GIBSONVILLE.—*Messenger*, July 21: The Nevada Hydraulic M. Co., of Gibsonville, a few days since unearthed a round quartz boulder perfectly plugged with gold. It panned $2,228—leaving some choice pieces for the lapidaries, which will swell the gross value to $2,500. It weighed 160 pounds.

FOREST CITY.—*Tribune*, July 26: The gravel that comes out of the South Fork ground at Forest City seems to be improving every day. One hundred and eighty-six ounces of gold was what the Extension Co. realized from the last seven days' work.

FOUR HILL MINE.—The Four Hill mine continues to look fine. Our informant says there is an abundant supply of ore in the mine fairly glittering with gold. The company will start a tunnel several hundred ft below the present one.

RAINBOW. A clean-up of $37,000 was made in the mill last Saturday after a run of three weeks with the 10 stamps. Surveyor Spaulding, of Forest City, commenced making the survey for the new tunnel this week. This will tap the ledge 360 ft below the present workings. It will require one year's time to finish the work, at an estimated cost of $30,000.

Butte *Record*, July 28: G. W. Cox, J. M. Williams and F. Becker, of the Union Co. of Howland Flat and St. Louis, and F. A. Gourley and J. P. De Moore, of the Union Ditch and Nevada Co. arrived in Oroville Monday, having with them three hundred and fifty pounds of gold dust, the result of the season's work of the above-named companies. The value of the gold dust is about $105,000. The parties left Oroville on Tuesday for San Francisco, to deliver it at the Mint.

Tuolumne.

LAMPLIGHT.—Sonora *Democrat*, July 28: The hoisting works on the Lamplight mine, at Confidence were entirely destroyed by fire on Tuesday. The shed, entire hoisting works and timbering for six lengths in the shaft were burned. Fortunately the shaft beyond, which was ventilated from an old tunnel enabled the miners to save the lower portion. The loss will exceed $3,000, insured for $1,500. Delay in opening the mine amounts to more than the actual loss.

NEVADA.

Washoe District.

Virginia *Chronicle*, July 25: Last evening the fires in the furnaces at the Crown Point were allowed to cool and the mine practically shut down. This is a severe blow to Gold Hill, but could not be averted. Supt. Jones bitterly regretted the condition of affairs, and extended his sympathies to the men thrown out of employment. The draft lets out about 140 miners and top hands. It is expected that a few will be put to work next Saturday to put things in shape. It is probable that the Yellow Jacket will also reduce its force soon on the same account—the scarcity of water in the river—which renders it impossible to crush one-quarter the former quantity of rock.

UNION CON.—*Enterprise*, July 28: Have completed repairs on the joint Mexican winzes from the 1800 to the 2300 level. The joint Sierra Nevada west crosscut on the 3000 level is in 68 ft beyond the east side of the 30 ft vein. During the week passed through a vein of milling ore seven ft thick.

SIERRA NEVADA.—North lateral drift No. 1 on the 2000 level has been extended 26 ft. On the 3000 level the joint Union Con. west drift cut seven ft of milling ore during the week.

MEXICAN.—Good headway is made in the raise from the 2600 level, notwithstanding that the rock is hard. The north drift on the 3100 level is steadily pushed forward.

YELLOW JACKET.—Explorations show a sufficient amount of low grade ore to last for some years.

THE CROWN POINT.—The miners will now be put to work again, as arrangements have been made for turning sufficient water back into the channel from the ranches up toward the head of the Carson river to start up all the mills to their full capacity.

ALTA.—Drain boxes are being placed in the drift leading out to the Sutro tunnel on the 1030 level and a pump tank is being constructed in the shaft at the same level.

HALE AND NORCROSS.—The connection between the upraise from the 2600 and the winze down from the 2100 level has been enlarged to the full size of the winze.

CALIFORNIA.—Have completed cutting out the tank station at the 2800 level in the C. and C. winze, and sinking to the 2900 level has been resumed. On the 2700 level the south drift has been advanced 15 ft.

OPHIR.—The repairs to the old Central tunnel and Mexican shaft are about completed. The tunnel enters the old works about 150 ft below the surface. Ore is still being extracted from the croppings.

CON. VIRGINIA.—The cutting out of the tank station at the 2800 level in the C. and C. winze has been completed, and sinking to the 2900 level resumed. On the 2700 level have completed a south drift.

GOULD AND CURRY.—Have discontinued work in the drifts for four or five days to allow the water to drain out. The pump at the Osbiston shaft is kept running.

SAVAGE.—The Hale and Norcross air connection being completed work will soon be resumed.

UTAH.—The drain pipe is all in place, and the water passing through it to the Sutro tunnel.

ANDES.—The west drift is in promising material, and low grade ore is being extracted.

BELCHER. As the mills are to be started up again on the river, all will doubtless go ahead as usual in the way of extracting ore.

CHOLLAR.—Will soon resume prospecting now that the air connection has been made in the Hale and Norcross.

BEST AND BELCHER. Have suspended work in the drifts on the 2500 level for a few days to allow the water to drain off.

UNION SHAFT. Are repairing the 1600 drain tunnel and 2300 station.

Candelaria District.

NORTHERN BELLE.—Owing to the extreme heat the southwest drift on the fifth shaft level has been extended only six ft during the week, making a total length of 163 ft. The face is in a ledge of hard sulphurets giving assays from $16 to $28 per ton. The stopes above the first level are turning out ore of very good grade. Everything is moving along satisfactorily about the mine, and the daily shipment of ore to the mills has been about 60 tons. Both mills are running and with good results. A bullion shipment of $10,045.86 was made on the 26th instant, making the total for July account $37,122.86.

MOUNT DIABLO.—The stope near winze No. 1, and below the third level, shows some 18 inches of $80 ore. The stope from lower winze No. 2 is giving some $50 ore from a narrow ledge. The stope below the third level, near the head of winze No. 2, shows 2½ ft of $90 ore. A small amount of ore of good grade is being taken from the third level. The intermediate stope, is giving a small amount of $120 ore. The east drift on the second level is yielding some $70 ore from narrow streaks. A small amount of $100 ore is being extracted from several places in the first level. A shipment was made on the 19th inst. of $6,124.19, and another on the 23d of $7,625.35.

Ploche District.

EL DORADO. *Record*, July 21: Mining at El Dorado Canyon is very active at present. The mill of the Southwestern company has shipped many thousand dollars in bullion since the mill first dropped stamps this run. The Techatticup mine keeps on yielding its usual quantity of high grade ore. The mines in the canyon are all looking well, and several of those owned by Cronin & Co. are valuable property. The chloriders are doing well.

TAYLOR DISTRICT. Dea. Shier, who has been on a trip to Taylor, reports the appearance about that place as being lively. There are about ninety men to work and several buildings under construction. The deepest mine in the district is not eighty feet.

Safford District.

ONONDAGA.—Eureka *Sentinel*, July 25: The Onondaga never looked better. The tunnel is now in a distance of 162 ft with the breast in high grade ore; crosscut south from tunnel 48 ft, with vein matter still in the face, showing a width of ledge over 48 ft at that point. The crosscut is started 72 ft from the mouth of the tunnel. The Zanoli is opening up a fine body of ore on the 80 foot level. Every blast develops some encouraging feature.

BANNER.—*World*, July 20: The Banner mill started up the other day with 15 stamps. The assaying is better than ever before, running from 109 to 113 ounces. They are employing at present 45 men.

NORTH STAR.—Wood river *Times*, July 25: J. O. Swift reports the North Star ore bodies opening up so well that he has ordered concentrating works which will be here in two or three weeks, and it will not require over a week thereafter to start up the works. The mine is yielding ten tons of ore per day, half of which is first-class and sold as it comes from the vein. The balance is left on the dump to await the concentrating works. Some 25 men are now employed. The works will be located about a mile from the mine.

BULLION GULCH.—From the mouth of Bullion gulch over the divide and down Narrow Gauge gulch is all activity—mining, building and prosperity. On the Narrow Gauge mines, men are building houses, mining, hauling lumber, carpentering, etc., and the prospects are good for a rival town to Bullion. The new metropolis is known as Orado.

ATLANTA.—*Statesman*, July 24: In the Monarch mine, the great ore chimney found on the surface and worked to the 200 ft level, yielded first-class ore to the value of $1,400,000, 1,000 tons of which sold in Omaha for $1,000 per ton. Besides this, there was a vast accumulation of low grade ore, which has remained in the dump, awaiting cheaper methods of reduction. Since the yield from these upper levels, the 300 and 400 ft levels have been opened, showing the same ore bodies.

Tuscarora District.

NAVAJO.—*Times-Review*, July 26: Total depth of shaft, 975 ft; progress 15 ft. Will have the sump completed this week. South drift, 450 level, extended 9 ft; total length, 324 ft. South drift, east lateral vein, 350 level, advanced 18 ft. Removing the old boilers, and the same will be converted into air receivers.

GRAND PRIZE AND ARGENTA.—Work has been resumed in the 300 and 400 levels of Grand Prize and the 300 level east of Argenta. The ledge in the drift going south in Grand Prize on the 400 level is improving.

ELKO CON.—Good progress has been made in timbering shaft No. 2. A section of the building for hoisting works is nearly complete, and all of the machinery has been placed in position.

INDEPENDENCE.—Good progress has been made with the work during the past week. Length of drift north, 300 level, 626 ft; progress, 20 ft. South drift, 400 level, extended 9 ft. Total length, 856 ft.

BELLE ISLE.—Total length of drift north, 450 level, 117 ft; progress, 11 ft. No change in the formation. No. 1 drift north, 350 level, advanced 18 ft; No. 2 drift, 13 ft.

NORTH BELLE ISLE.—The usual progress has been made in extending the drift south on the 300 level.

White Pine District.

TAYLOR.—Eureka *Sentinel*, July 24: We are indebted to Mr. Ferguson for some fine specimens from Taylor. Two are from the Monitor mine, and show richness in horn silver. The Monitor has a ten-stamp mill, run by water. The Argus mine is to have a 20-stamp mill. Mr. Ferguson says there is a quantity of low grade ore in the district that can not be estimated. He never saw the like before.

ARIZONA.

PIONEER.—Globe *Chronicle*, July 21: The first shipment of bullion from the Howard 10-stamp mill was made on the 18th. The shipment was 20 bars less than three weeks run. The Pioneer mine is turning out several bars regularly each week. The shipments of the Old Dominion Co. the past week were 23 bars—8097 lbs. Total shipments to date, 3,702,527 lbs. Furnace No. 2 is running steadily. A large quantity of coke is arriving and another furnace will shortly be started. The Kane mine owners had some ore worked at the Isabella mill, the product of which was phenomenal. The first worked $1,496.40 per ton; the second class $328.95 and the third class $112.23. Not long ago a batch of 20 tons from this mine worked at the Stonewall Jackson mill, yielded $541.80 to the ton.

THE ONE HUNDRED AND ONE.—Prescott *Miner*, July 20: Yesterday, George Burton and Wm. H. Davis, late foreman of the Vulture and one of the best judges of mineral in the country, visited the bonanza and the best prospects he had seen in Northern Arizona. They pay streak is full five ft wide and works by arastra process over $40 to the ton. The mine is owned by Burton, Nolan & Vanderbilt.

MINERAL PARK. *Alta Arizona*, July 21: R. D. Hamilton in Todd basin is taking out some very rich ore. Ed. Smith's newly discovered silver mine in Todd basin has a six inch ledge that runs $125 to the ton. The New London at Todd basin is down over 100 ft. They are still taking out high grade ore. The Cupel M. Co. of Stockton, are to deliver 20 tons of high grade ore to Chamberlain's sampling works at Kingman. The Rain Bow mine at Todd basin has four different openings carrying gold, silver and galena. J. C. Asbury and Tobe Wilkerson made a trip to their new discovery on the west side of the Black range, this week. They claim the ledge shows on top of the ground for 2,000 ft. They have had three assays made which gave round numbers $135, $175 and $400.

COLORADO.

CENTRAL CITY.—*Register-Call.*—July 20: Two loads of mill dirt taken out of the Shamrock lode, owned by James P. Agnew, James Bosanko and others, sent to the Randolph mill in Black Hawk, yielded four ounces of gold—equal to eight ounces per cord. Prof. Tyler made an assay from the smelting ore being taken out, which gave 32.22 ounces gold, and 14.01 ounces silver per ton, having an assay value of $656.85 and a market value of $607.09 per ton. There was left at the First National bank last Tuesday 114 ounces of Perigo gold retort, the product of 31 stamps of less than a two weeks' run. A cord of ore treated at the New York mill in Black Hawk from the Free American mine on Caledonia mountain, Hawkeye district, yielded eight ounces and eight pennyweights gold. The quartz and dirt came from a depth of about 17 feet. This is an average of the crevice matter which is fully eighteen inches in width. The gold brought at the First National bank, this city, $17.25 per ounce. The lessees of the Independent lode, property of Thomas H. Potter and W. H. Cheatley, are taking out surface quartz which carries considerable galena. An assay made a few days ago gave 10 ounces gold per ton.

CAMP CLIFFORD.—Mr. Young, who has been driving an adit on the Jenny Lind lode, has cut into a twenty inch vein of almost solid mineral—galena gray copper, which contains considerable ruby silver. All miners who have visited it consider it the most important strike that has been made in that camp for the past twelve months. The adit has been run a distance of over 210 feet from its entrance.

UTE CREEK.—*Courier*, July 19: The Andes Co. have resumed work. At present they are drifting. As soon as the surface water disappears the shaft will be sunk 100 feet. They have seven inches of ore that mills from 300 to 400 ounces per ton. Redd & Bell have a new discovery near the Humboldt, the ore from which assays up in the hundreds. Work on the Wallace has been suspended on account of water. The shaft will be sunk deeper as soon as water will permit. Work is to be resumed soon on the Financier.

FREELAND.—*Courier*, July 26: The gross value of coarse ore shipped by this mine during the month of June was $21,393.12; the gross value of concentrates $13,382.44; a total of $34,775.56. The expenses for the month were $7,747.50.

EAST LEXINGTON. We were shown $46 worth of gold retort by Mr. Meade, of Idaho springs, taken from 1500 pounds of second class ore from the East Lexington lode, Soda creek. The first-class ore mills nearly 22 ounces gold and 29 ounces silver per ton at Golden, and nets the owners $440 per ton. The developments consist of 125 ft of surface workings, and a 28-ft shaft.

IDAHO.

WOOD RIVER. *Times*, July 18: Bullion camp never was as prosperous as now. The jigger is not yet done. The concentrator will be running in 10 days when 50 additional miners will be employed. The Idahoan jigger below town will be finished in 20 days, and another 50 miners placed at work. The ore chutes are holding out to the lowest level; one vein is seven ft wide, and widening, and over $500,000 worth of ore in sight. Within 30 days the hoisting works of the Eureka will be completed, and an additional number of miners put to work. Timothy O'Leary has uncovered a fine body of ore in the Snake River View mine. It is between the Mountain View and Ellen Stilts mines, on the southwest slope of Bullion hill. Barney Quigg has it richer and larger in the Mountain View, and is determined to sink 400 ft more on the vein. He has 78 inches of 700 ounce ore. The mountain View is on the divide of the Bullion hill, adjoining the Rising Sun and the Snake River View mines.

VIENNA.—The strike is a five ft ore body averaging 150 ounces in silver to the ton. Captain James Black has just returned from Vienna. Captain Black and John Congdon, will soon be millionaires. Jos. Reiley, of Vienna, has a big prospect not far from the Solace mine and is developing it. The ore assays into the thousands.

ATLANTA.—Major W. H. Pettit, of the Atlanta M. Co., reports quite a boom. There are probably 200 men at work in town and in the immediate vicinity, two mills of 20 stamps each are going up and a good deal of building is going on. The mine is opening up splendidly, the ore chimney found above having been cut on the 300 and 400 levels. From the surface to the 200 level this mine yielded $1,400,000 of first-class ore, 1,000 tons of which sold in Omaha for $1,000 per ton. At present, in addition to the low grade ore reserves in the upper levels, there is a large body of ore in the three lower levels, and the vein is over 80 ft wide in places.

MONTANA.

TIDAL WAVE.—Butte *Miner*, July 18: Ten men are now at work on the smelter going up on Wisconsin gulch. Mr. Jones is putting up the smelter. The gold mill erected by Noah Armstrong is having a steady run on ore from the Two Dams and Melrose leads. The first day's run they cleaned up over one pound of gold. It is reported that Gideon & Root have consummated a sale of the Tidal Wave mine, for $40,000, and McCormick & Co., are the purchasers. Capitalists from Salt Lake and California are looking over the district. Everything seems lively. Ore found in this camp assays as high as $6,000 per ton.

PHILLIPSBURG.—Butte *Miner*, July 21: This town is coming to the front with some of the finest bullion shipment ever made through the Pacific Express office in this city; 24 bars from the Granite mountain valued at $48,624, and 10 bars from the Hope valued at $12,768 passed through yesterday. Reports indicate that the Phillipsburg district, in which little work has been done for some years is having a genuine boom. This is owing to the recent developments on the Granite mountains in tunnel No. 2. The tunnel has a length of more than 1,000 ft. The pay ore was first encountered at a distance from the face of about 900 ft, from which point the ore has preserved a width of three ft, increasing to five, for a length of 130 ft.

EAGLE ROCK.—Butte *Miner*, July 18: High water in Snake river has somewhat interfered with mining. The sluice boxes have been temporarily removed, but are replaced, as the water subsides. Two new companies are beginning work. One is making a ditch on the west side of the river. A number of gentlemen from Chicago will be at Eagle Rock this week. They come on the part of the St. Paul Placer M. Co., made up of men of large capital—mostly residents of Chicago and St. Paul.

NEW MEXICO.

FLEMING DISTRICT.—*Southwest Sentinel*, July 18: The Hermosillo, Quartzite and Round Top are three claims in Fleming district, a short distance to the southeast of the Penroze Bonanza. The owners now have an open cut about 20 ft long and 4 ft wide; run in on a contact of lime and quartzite; and the breast of the cut, which is 12 ft high, is in ore which runs 211 ounces to the ton. Jno. R. Magruder shipped some 10 tons of lead an silver bullion, last Monday. It is the first shipment from the smelter of the Southwestern Co., at Ivanhoe.

MONTEZUMA.—Teams are hauling ore from the Montezuma mine in Cook's range, to the Ivanhoe smelter at San Jose. The ore averages 40% in lead, and is the best flux yet found in southern New Mexico. There are about 1,000 tons on the dumps, and fully 3,000 tons more blocked out in the mine, which can be raised for 50 cents per ton. Aside from its fluxing qualities the ore runs about 10 ounces in silver to the ton.

GEORGETOWN.—The McGregor mine at Georgetown, shows no signs of giving out. The drift, which is 10 by 12 ft face, is now in 15 ft, with an unbroken body of ore on both sides and at the top. The amount in actual sight is estimated at fully 200 tons. From the roof of the drift to the next level above, is just five ft, and this is known to consist entirely of ore—of very high grade—fully 150 ounces to the ton.

OLD MAN MINE.—As work progresses it becomes more and more clearly established that the value of the Old Man mine is in its low grade ore rather than the enormously rich deposits which were first opened up on its surface. That the mine has a permanent body of this low grade ore, running from 70 to 80 ounces, no experienced miner can doubt.

CHLORIDE.—Las Vegas *Gazette*, July 18: There are only one or two claims in the vicinity of Chloride that are being worked at the present time. Men are working on the Silver Monument about 14 miles away, and are down 80 ft and in good paying rock. The Buffum is working four men. They are down 135 ft in ore all the way, which has given 100 ounces as an average. The rest of the mines are lying idle for lack of capital. The Santa Rita is idle, pending negotiations with the English syndicate which is arranging to purchase the property. The price asked for the 46 patented claims is $6,000,000. John A. Miller has had returns from a shipments of ore from the Columbia mine, at Lake Valley. The first grade averaged 1840 ounces; second grade 616 ounces; third grade 131 ounces. About five tons per day is now being taken out. Work is progressing on the Struby and Emporia, which with the Columbia comprise Sierra Bella group.

KINGSTON.—*Tribune*, July 26: The Hardscrabble mine in Socorro county has been sold for $125,000. The North Homestake, at Baxter gulch, shows a fine lead of milling rock in a 12-ft shaft of 50 inches from top to bottom. The Midnight mine, Magdalena mountains, has a wide vein carrying ore that runs from 30 to 40 ounces in silver. A 25-ft shaft at the interseetion of the Pinon and Pinon Extension mines, Magdalena mountains, has exposed a four-ft streak of ore assaying from 50 to 500 ounces in silver. The Pueblo Spring mine, shows at a depth of 48 ft, an 8-ft vein. The mineral is argentiferous galena, yielding 100 ounces in silver and 50% lead. Col. Hutchason brought in yesterday a sackful of magnificent ore from the Lookout mine in the Magdalenas, which was struck in a 30-ft tunnel. It very much resembles the Lake Valley ore, and samples ran 500 ounces in silver. Word was received in Albuquerque on the 23d, that another very rich strike had been made in the Homestake mine.

OREGON.

BAKER CITY.—*Tribune*, July 17: Messrs. Rockfellow and Travillion had Mr. Foster's assissant at work surveying their quartz mine, on Sutton creek, 15 miles from town, on Saturday. Assays of the ore show it to be rich. No great amount of prospecting has been done as yet, but enough rock has been laid bare to show the ledge to be large and valuable.

Working Ore at the Manhattan Mill.

From the Austin correspondence of the Virginia *Enterprise* we take the following:

For nearly nine months the Manhattan mill has been running almost continuously, and the present run will be recorded as the longest it has ever made. Being the only working mill in the district, all the ore produced from the mines of Austin and vicinity are brought to it for reduction, and some lots even come from a considerable distance, Jefferson canyon, for instance, seventy-five miles away. It is a dry-crushing, twenty-stamp mill, and works the ores by the Stedefeldt process. Each of the twenty stamps weighs 1,000 pounds, and strikes nearly 100 blows a minute, making the dust fly at an extremely lively rate. When so many separate lots of ore are brought in from the various mines and localities for working, a very complete and careful system is called into requisition to keep them separate from each other until they have got through the batteries. And this is done very effectually and satisfactorily. The twenty stamps are arranged in four batteries of five stamps each, working side by side, thus allowing four separate and distinct lots of ore to be milled at one and the same time, if required. By frequent sampling of the pulp, as it passes through the battery screens in the shape of a dry powder as fine as flour, the assay value of each separate lot is ascertained and its bullion yield determined. Thus each battery can be run on separate and independent lots or ore, or all four be employed on a single large lot. After passing the batteries, however, separate working ceases, the pulp being carried forward collectively through the rest of the process.

Chlorination.

From the batteries the pulp passes forward to where a small two-stamp battery supplies it with pulverized salt, and it is mechanically mixed therewith to the extent of ten per cent, more or less, according to the richness of the ore, the richest ore requiring the most salt. Thence it passes through an elevator to the top of the roasting furnace, which is forty-eight feet high, substantially constructed of brick. Here it is discharged upon screens placed directly on top of the chimney-like furnace, and these screens, mechanically moving past each other, allow the pulp to sift and drop evenly down through forty-eight feet of fire flame to the bottom. This is a decidedly hot fire, created by two charcoal furnaces, on opposite sides, near the base. The heaviest and principal portion of the pulp dropping down through this column of fire, experiences the chlorination process in so doing, and falls in a red-hot pile at the bottom, changed from its sulphuret character to a chloride. Thence it is drawn or hoed ont through a small door, every hour, for transfer to the pan and amalgamation department.

Flue Dust.

Altbough, as before remarked, the heaviest and principal portion of the pulp drops to the bottom of the furnace, a considerable and valuable portion is carried elsewhere by the force and draft of the flaming furnace. The flue turns just beneath the pulp screen, at the top, and passes downward and backward through a series of dust chambers, contained in a substantial brick structure, seventy feet long by sixteen wide and ten or twelve feet high. There are sixteen of these chambers or compartments, and the flame and heat of the furnace, laden with its light, rich ore dust, passes zigzag through the entire series, and thence through outside passages to a huge brick chimney, eighty-five feet high, which finally carries the heat and smoke to join the general atmosphere, the distance thus intrinsically traversed by it from the furnace being over 500 feet. This, of course, is to give the pulp a chance to settle. Through convenient doors in the dust chambers and passages, their captured pulp is drawn out once a month and taken to the pans. And it furnishes the finest of the bullion. This Stedefelt furnace was the second erected in the State, the first being at the Auburn mill, near Reno.

The Pan Department.

From the furnace, the chlorinated and chloridized pulp, after being cooled somewhat, is run on cars into the pan room, near by. This department contains eight pans with a settler to each. The pans are five feet in diameter by two and a half feet deep, and are simply plain pans, with wooden sides and iron bottoms, and provided with the usual style of mullers, making about seventy revolutions a minute. The settlers are similar in style, six feet in diameter, with wooden mullers or agitators, making twelve revolutions a minute. Each pan works a ton at a charge, occupying eight hours for each charge, or three charges every twenty-four hours. About 600 pounds of quicksilver are used to each charge, and even up to 1,000 or more, in case the ore is unusually rich. More or less salt, as required, is also used in the pans, together with cyanide of potassium, scraps, and borings of iron and other desirable chemical agents. The amalgam is all placed in a large and very substantial cast-iron steamer, and the surplus quicksilver very speedily forced out of it by hydraulic pressure. The

Retorting and Melting

Department, which adjoins the pan room, is very conveniently managed, and certainly gives very gratifying results. It contains three large retorts and two melting furnaces, and every day or two, according to the richness of the ore worked, turns out a shipment of ten nice bricks of silver bullion worth a thousand dollars each. Charles Durning is superintendent of the mill, and has been for many years, having been an active and respected resident of Austin since 1864. It keeps him pretty busy looking ont for the different departments of the institution under his charge, but he is fully equal to the task, and understands his business.

The Motive Power

Running the entire mill, as well as furnishing requisite power to the machine shop and some other outside arrangements, is supplied by one of the best and most effective steam engines in this section. It is a Putnam valve horizontal engine with eighteen-inch cylinder and forty-two-inch stroke, rated at 140 horse power. The fly wheel is eighteen feet in diameter, and weighs 14,000 pounds. This engine is from the Union Iron Works, San Francisco, and with its bed, eighteen feet long, must have been a very ponderous affair to freight over the Sierra and across the flats before the advent of the railroad. The boiler room contains three pairs of tubular boilers, two sets of them in constant use and the third kept in reserve. One very effective feature here consists in the recent adoption of six-inch upright columns of steam pipes, nine on each side of the fire boxes or furnaces. These are connected with the boilers, and are of very important assistance in getting up steam. There is no trouble in getting up all the steam required, and more too. A great saving of fuel is also effected. About seven cords of nutpine wood are burned daily. The Chief Engineer in charge of this department is Eph. Wager, and he takes a very evident degree of pride in it.

The Machine Shops.

The numerous mining works naturally created a demand for an establishment right here where repairing could be done and machinery made without having to send hundreds of miles for that purpose. The result was that from a small blacksmith shop the present extensive and very complete establishment has grown by frequent and judicious additions. It contains big forges, a steam hammer, lathes, planers, turning, drilling and sawing machines, all of the latest patterns and the most substantial description, and any work required can be turned out at short notice, from a six-foot hoisting reel to a big steam engine. Moreover, as has been before remarked, just as well finished and effective work can be turned out of these shops as from any establishment this side of San Francisco. A. E. Johnson is the master mechanic in charge of this department, and under his efficient supervision constant improvement is shown.

The Foundry.

Which is conveniently situated near by, is under the charge of James Lovell, a very competent and skillful workman. It is not so extensive as some of the San Francisco foundries, but what work it does turn out is first class and fully up to the requirements. It was a good idea on the part of the Manhattan Company to thus establish their own shops where they could do all their own work as required, and make all necessary repairs instead of having to send so far away in case of accident or for any new work required. The necessities of the isolated situation, however, prompted the practical adoption of the idea.

Other Departments.

The assay office of the company, across the road from the mill, is properly furnished in all its details, and is engineered by Jacob Trolson, who also acts, when occasion requires, as surveyor in and about the mines. The main office of the company, also near the mill, is a very unpretentious structure, but a large amount of very responsible business is transacted therein. M. J. Farrell is chief clerk in charge, and has been for numerous years. John Frost, the old original locator of the mines, still presides over them in the capacity of superintendent of the machinery of the various works, both above and below ground, and is a very efficient man for that responsible position. The whole, mines, mill, workshops, and all connected with the Manhattan Company, are under the superintendence of Melville Curtis, a very wide awake sort of a gentleman. His work and success tells its own story.

FINING MINING COMPANIES.—The Marysville *Appeal*, July 22d, says: Early in the present month, in the suit of Yuba county vs. the Eureka Lake and Blue Tent hydraulic mining companies, an order was issued by the Superior Court of this county requiring defendants to appear on the 21st instant, and show cause why they should not be punished for contempt of injunction in continuing to discharge debris from their mines into the Yuba river. There was no appearance yesterday for the defendants, and Judge Keyser imposed a fine of $500 upon the Eureka Lake company and a fine of $250 upon the Blue Tent company. The Eureka Lake company was some time ago fined $250 for contempt in the same case, which fine is still unpaid. No greater fine than $500 can be imposed for contempt, but the fine can be repeated from time to time so long as the contempt continues. The fines in these cases, of course, constitute a lien upon the property of the companies fined.

FROM the Rainbow mine, Sierra county, $100,000 has been taken out in the last thirty days. Miners are working on the ledge a distance of seventy-five feet apart, and the ore of both points is said to be enormously rich.

The Wonders of New Mexico.

There is a remarkable salt lake situated 150 miles west of Albuquerque, in New Mexico, and about fifty miles from the Arizona line. The lake is located on the top of a volcano mountain, and evidently occupies an extinct crater. It is perhaps three-quarters of a mile in diameter, and is so strongly impregnated with salt that a thick crust of pure white salt, of a spongy consistency, like floating ice, encrusts the margin. It is so plentiful that it is carried away by the wagon load. It has been long used by the Indians. The salt is white, of the purest quality and destitute of sand or any foreign ingredient. The texture is porous, like congealed white foam.

The most curious feature of this lake is a tall column, or monument-shaped formation, which rose up near the center to the height of 100 feet, and which appeared to be composed of white lava thrown up by some convulsion during some ancient period. The outside of this singular column is sloped from the base towards the top, and was rough enough to enable it to be ascended. On reaching the top of the cone, the interior we found to be hollow like a tube, and at the bottom there was seen a circular pond of water with bright emerald green color in appearance, probably to be attributed to the sparse rays of which penetrated the huge tube, and were reflected from the smooth, mirror-like surface of the water. On the projecting sides of the interior of this bowl were found no incrustations of salt on the surface like that on the outside, but on thrusting the hand into the water and withdrawing it the hand came out perfectly white from particles of salt that adhered to it. It was evidently a very strong brine.

There is also a desolate, arid plain, composed of lava, 100 miles in width, situated beyond the Organ mountains, so called because the basaltic columns rising up, as seen at a distance, resemble the pipes of an organ. The great plain beyond is about eighty miles west of Las Cruces. It is entirely destitute of water, which has to be conveyed by those crossing this inhospitable waste. But the remarkable thing about this desert is an immense stratum of gypsum or selmite of a pure white color, and when seen from a distance resembles a huge snow drift. The gypsum bed is several miles in extent, and is in sufficient abundance to furnish a supply for all purposes for which it is used to the habitable globe. There are other remarkable physical appearances in the region mentioned scarcely known to the outside world. It is a scene of wonders.—*Times.*

GOLD FROM PERUVIAN RIVERS.—The whole of the Chuncamba (Peru), says a correspondent in *Iron*, for a number of leagues above and below the Temple of the Sun is auriferous, and the inhabitants of the province Huamelies, through which it passes, obtain, by washing the sand, and by means of sheepskins, $200,000 or $300,000 worth of gold annually. The wool on the skin is cut out until it is about half an inch in length. The skins are then anchored down, with the wool side up, by means of loose stones placed on them, in and below the various rapids, in which position they are suffered to remain from six to twenty-four hours. They are then carefully raised out of the water, turned wool side downward into a batea (tub) of water, and thoroughly washed; the gold falling from the wool of the skin is finally collected from the bottom of the batea. Sheep were unknown to the Incas, and as they obtained an immense amount of gold from this Pactolean stream, it is presumed that they used the skins llama and those of the vicuna. The above will not only be of interest to the general reader, but will also furnish a wrinkle to gold miners similarly situated.

THE PROSPECTOR.—Speaking about the life of a prospector, the Salt Lake *Tribune* says: It requires men who do not wilt because they are broke; who can enjoy the sun, rain and rough fare, and work 15 hours a day; who outwalk a horse without a dollar in their purses for 12 months every year. What a charm there is in this free life under the all-embracing kindly sky of the Rocky Mountains. No care of church, State or household. All the world ahead, no property or money to bother about, with everything to hope and little to lose. No spike-tail coat to be crushed, white shirt to be "biled," fine boots to be shined or duties to society to be performed. No calling to assist the Great Ruler in regulating and running the universe. None of few of the petty things, in short, that fret the life away after once it has settled into its rut. The West is full of men who put in their young years in the happy-go-lucky style of the "prospector," and half their regret for the loss of their first youth comes from the fact that they must now be housed up, cabined, cribbed, confined. Is the genus "prospector" to go out? We trust not yet.

FRUITS OF THE PEACE POLICY.—In 1869 the Navajo Indians were furnished by the Government with 14,000 sheep and 1,000 goats, as an experiment to see whether they would take kindly to stock raising. The animals were supplied at a cost of $30,000. These Indians have now 900,000 sheep and 200,000 goats, raise a million pounds of wool yearly, and support themselves. Previous to that period it had cost the Government more annually to prevent their committing depredations than the sum expended for the stock of sheep and goats so donated to them.

Grub-Staking.

An interesting result of the system of outfitting prospectors on shares is given in some recent finds and locations made through this system. E. L. Preston, manager for Isador Morris & Co., Vienna, some time ago put up the cash for outfitting a prospector to go to the bills. The cost of the expedition was light, and Mr. Preston hardly felt it any inconvenience. Last week he was called out to the seat of operations to inspect results. They are extremely satisfactory. Mr. Preston has returned and gives an outline of the locations made.

There are five, and all situated on Elkhorn gulch, or more properly, on the second gulch up tributary to Elkhorn gulch, and entering it above the Elkhorn mine on the east, and near the summit of the divide between Elkhorn gulch and the east fork. These locations being made in the past thirty days by one prospector, prove that the country is not prospected by any means. The first location is the Baltimore, a galena mine, upon which an incline shaft fifteen feet deep has been sunk, and a two-foot body of solid galena stands there, which returns by assay 218 ounces in silver and 70 per cent in lead. This was the lowest assay, and the vein is solid down as far as opened. It was a blind ledge. The second location is in the same vein, and recorded as the Queen Victoria. The vein is four to six feet wide, in no place less than four feet, and the ore carries copper, black sulphurets of silver, bromide, and chloride, and runs up to 1,000 ounces in silver to the ton. Is is opened by a cut upon the course of the lode. The third location is the southerly extention on the Queen Victoria, called the Minnie May, and shows the same body of ore. The other two locations are not developed as yet. One, located as the Ida Hardin, is on a separate vein, and has six inches solid of high grade galena in place lying contiguous to a heavy iron vein and sand carbonates between.

The carbonate deposit is two to four feet, the iron ore is five feet thick, and carries galena all through, and next is the six inches of galena on the hanging wall.

Mr. Preston is arranging to employ enough miners to start developements on an extensive scale. There is already $2,000 worth of ore on the dumps, and the product will pay handsome profits over all working expenses. — *Wood River Times.*

THE IRON MINE.—Assessor Wheeler gives the Grass Valley *Tidings* some items about the iron mine twenty miles below that town. Using eighty bushels of coal to the ton of iron, the mine is now turning out twenty-four and a half tons of iron per day, and one day thirty tons were turned out of the furnace. Last year 185 bushels of coal were used to turn out one ton of iron, and the result was only about half the amount turned out daily. There are now 165 men employed about the mine, and they get from $2.50 to $3 per day. The company issue scrip to their employes in any amount, from five cents to $5, and issue it as often as it is wanted. The scrip is good anywhere in the town of Hotaling, as it will buy breadstuffs at the stores. None of the employes are compelled to trade at the company's stores. The mine is in a better condition than it has ever been, and wood-choppers and teamsters are in demand there. This mine is owned by the California Iron and Steel Company, and supplies the Judson Iron and Nail Works of this city with their raw material.

NEW MILL.—The new twenty-stamp mill of the Golden Rule mine, at Dragoon, Arizona, that was recently purchased from Fraser & Chalmers, was landed at the millsite on June 4th, and the work of erecting the mill is being pushed by a strong force of men, under the supervision of Capt. B. F. Marrow, of Silver City, N. M. Mr. D. M. O'Sullivan, a machinist of high reputation, recently in charge of the machinery at the Santa Rita mine, is superintending the placing of the machinery. It is expected to have the mill in operation by September 1st. The mill will reduce from fifty to sixty tons per day, and save a high percentage of the assay value of the ores. Capt. P. J. Mitchell, of Silver City, is in charge of the mines, and is pushing developments rapidly with a force of thirty miners.—*Silver City Enterprise.*

THE recent rich strikes made at Juniper Springs continue to turn out even better than it was at first expected they would. Several assays have recently been made on ore taken from the Rico mine, owned by Messrs Lincoln and Lily, and Ensign and Smith, which run as high as $306 2.10 in silver, and $ 2.10 in copper. The pay streak in the ledge is four and one-half feet wide, and gives every indication of permanency.—*Silver City Enterprise.*

FRUE VANNERS.—We visited Lunt's mill, at the Mosquito toll gate, and found that Mr. Lunt is highly satisfied with his Frue-Vanner concentrating belt. This is the first of this kind of concentrators in use in Park county, and the appearance of the concentrated mineral taken by it from the U. P. and K. P. ores gives abundant assurance that it is doing excellent work. The Lunt mill is run by water power, but in time a change will be made to steam.—*Fairplay (Col.) Flume.*

A FEW miners are still working at Meadow Lake. That is the place where "a process" is needed more than anywhere else.

Improving Prospects at Wood River.

Last year the owners of prospects on Wood River, says the *Ketchum Keystone*, saw that the galena veins were lessening in width as depth was obtained on them, and many fearing that development would only prove their properties almost worthless, relinquished work and commenced trying to sell. Efforts to dispose of undeveloped properties proved unsuccessful, as capital seeks only mines that are thoroughly proven as such, and the owners of the numerous prospects at last realized the fact that their only alternative was to run the chances, and, by tapping the veins at good depth, find whether they were permanent. This was done, and in every instance that we know of, the veins, after narrowing opened out wider and richer than they were near the surface, and many that were only fair prospects last year are now recognized as fine mines. We do not think there is another country in the West that can show such a general tendency of so many prospects toward becoming mines of great value. There are already enough proven on Salmon and Wood rivers to insure a good, healthy boom in the near future. But few, in fact, realize the important part that this great mineral belt will play in the mining world from this time forward. The ores are not only very extensive and in hundreds of veins, but they are of great richness. What we most need now is a few more under the control of men able to handle them and erect works for the reduction of ores. This will come about gradually, and the wealth of the country increase. The dullest times for this section were experienced last year.

As late as last year all classes of business were mainly dependent on a boom and transient custom, but now business is conducted on a more sound basis. Less than a year ago we heard men declare that the two stacks of the Philadelphia smelter, then running, were capable of reducing twice as much ore as the country around Ketchum could produce; still, the company, having implicit confidence in the permanency and richness of the mines, made preparations for increasing the capacity from eighty to 160 tons per day, and now have every reason to congratulate themselves, as the amount of ores daily extracted from the mines of Warm Springs creek and Elkhorn gulch alone are more than can be reduced by the works. This is insuring permanency for Ketchum, and the time is rapidly approaching when more smelters will be required, as this is the grand center of the whole upper country. Warm Springs creek, Elkhorn gulch, Boulder, Trail Creek, and some other important districts are directly tributary to Ketchum, which is also the business center for the districts of Big Smoky, the east fork of the Salmon, Sheep Mountain, Sawtooth, Vienna and Galena. It will also be the terminus of the Wood river branch of the O. S. L., and advance with a rapidity not witnessed in any other town in the Territory since the great placer days of the sixties.

A year ago the braying of the mule and voice of the oxdriver could be heard all along the river. Nothing but the primitive modes of transportation could be seen on the trails and roads. But a wonderful change has taken place this year, and the locomotive whistle signals the arrival of railroad trains, only a little over twelve hours from Salt Lake city; and the telegraph line enables business to be transacted with any part of the world daily. Civilization as witnessed in the older countries, is coming, and we are assured of a prosperity, unsurpassed by either Leadville or Butte.

A Furnace for Inyo.—The Inyo *Independent* says: About ten days ago a new body of ore, measuring may tons, was opened in the Montezuma mine. It is of high grade, and gives promise of being as extensive as the body heretofore opened and developed. The new find is situated about 300 feet below the present dump, and dips into the hill as if it ran into and formed a part of the deposit from which the old body of ore is an outpnt. It is exceedingly suggestive, in that it indicates the presence of a very extensive deposit throughout the entire hill. Explorations at this point will be vigorously prosecuted, and it is confidently expected that results will largely increase the extent and value of the property. It is the opinion of several leading experts, who have recently examined this property, that the Montezuma is a large and permanent mine, and that the wonderful product of Cerro Gordo will be here rivalled. On Monday last the furnace site was located and surveyed; a side track laid out and at the present time the grading and track laying are being carried forward to connect the site with the main railroad track. The material and lumber for the furnace are enroute, and will all be on the ground by the first of next week, when work will be begun and prosecuted in earnest. The mine and furnace are owned by the Owens River Mining and Smelting Company. The station and grounds have been named Elma, in honor of the daughter of W. P. Miller, the superintendent of the company.

A remarkably rich quartz bowlder weighing 160 pounds was hydraulieed out of the bank of the Nevada Hydraulic Co., at Gibsonville, last week. The bowlder was smoothly washed, having the appearance of being ground in a potthole. Its value is about $2,500, and nearly all of it is suitable for quartz jewelry.

Useful Information.

Alligator Leather.

The hide of the alligator, which was first tanned as a curiosity, has now become quite an important article of merchandise, and is worked up into a multitude of articles of everyday use. The New York *Sun* furnishes the following:

A large variety of pocket-books, card-cases, hand bags, and other articles made of a peculiar mottled leather, was seen in a Chambers street show-case. A long, narrow piece of the same leather hung over them. It was rounded at one end and tapered away at the other. Two flippers projected from each side of it.

"The use of the alligator skin seems to be increasing," the reporter said to the proprietor of the show-case.

"The increase is astonishing," he replied. "Twelve or fifteen years ago alligator leather was tanned as a curiosity. Few articles were made of it. About four years ago, however, the manufacture of alligator leather began in earnest. First a few shoes were made of it, and the manufacturers of such goods saw there was something in it. It is a peculiarly beautiful leather. There are no two skins marked just alike, and it follows that no two articles made of the leather can be alike. The natural color of the leather is attractive, aside from the beauty of the markings. It finishes soft and flexible. It is conceded the Americans tan and finish it in a manner superior to the best workmanship in the old country. Here is a pocket-book. American alligator skin forms the outside; American calfskin the lining. Any judge of such goods will say that it is by all odds the handsomest as well as the best leather of the kind in existence. Sixty dollars per dozen for such goods, small as they are, is a low price.

"While the beauty of alligator leather is its chief characteristic, its durability is of hardly less importance. These grip-sacks of alligator leather will outwear their owners, no matter how youthful. With these two things in its favor, it is no wonder that the sale of alligator leather is increasing."

"How many alligators were slaughtered to satisfy the demand last year?"

"Not less than half a million."

"How do you get the skins, and where do they come from?"

"Most of them come from Florida and the other Gulf States. The alligators are shot with rifles, and the negroes have almost a monopoly of the business. When an alligator crawls out on the sand for his after-dinner sleep he falls a victim. The negro gets from fifty cents to one dollar apiece for alligators. The hunt is carried on so vigorously that the reptiles are beginning to grow scarce. Laws will have to be enacted to protect them during the breeding season and when young.

"All sizes from two to eighteen feet in length are now killed. The choice skin is six feet long. There is as much difference between the six-foot skin and the eighteen-foot skin as there is between a calf-skin and an ox-hide. The skins are packed in lime for two months to remove the horny scales. The remaining process is much like that for any leather. It takes four months to prepare a skin. There is a tannery for alligator skins in Brooklyn."

"Has any one developed an imitation of alligator leather?"

"The frauds are in using imperfect skins. No lime will soften the horns that have stood the attrition of red hot sand for half a century. Those skins do not wear well between the scales. There are other imperfections in the skins. The demand for colored goods helps us out, however, as the coloring matter covers a multitude of imperfections. When you want an alligator leather article of any kind choose the uncolored goods, pay a fair price, and you will get the cheapest as well as the handsomest and best."

A New Process for rendering textile fabrics impermeable has been devised by a French inventor (M. Piron), which, while it makes them impermeable to air and moisture, at the same time prevents them from rotting, and preserves their flexibility and softness unimpaired. The invention consists of impregnating the fabric with the oil obtained by distillation from birch bark. This oil is used in the preparation of Russia leather, and contains a peculiar phenol, which imparts the agreeable perfume possessed by this leather. It is soluble in all proportions in alcohol, and may be united with coloring matters. When applied to textile fabrics in the form of a thin varnish, it penetrates to every portion, filling the capillary vessels and covering them with a film of very elastic varnish which is proof against water fresh or salt, acids, alkalies and mildew. Fabrics thus prepared are affirmed to be made very imperishable. Not only woven fabrics, but rope, cordage, etc., may be treated with good results.

For Cleaning Black Cloth.—Take one ounce of extract of logwood, dissolve in a little boiling water, strain it and have ready a pail or kettle two-thirds full of boiling water, pour in the extract and add a large tablespoonful each of soft soap and washing soda, and stir altogether; then put in your goods and keep stirring them for ten or fifteen minutes; then take them out and rinse them up and down in a tub of water a few times, hang out, and iron on the wrong side when about half dry. Do not ring them. A snuff-colored brown will be a seal brown. This is only for cleansing rusty black.

Test for Wines.—M. Pradines has recently published a test for wines, by which wines may be examined for their purity. He proposes with this test to answer three questions. First, is the wine natural, secondly, is it diluted, and lastly, has no product of the grape been used in its preparation? The reagent used consists of pure ammonia saturated with rectified ether, which is then filtered and kept in well stoppered flasks protected from the light. To make the test, pour some water in a test tube, add with a pipette or burette about fifty drops of the wine to be tested, shake the mixture, allow five or six drops of the reagent (Diamo-Paradines) to run into the mixture, and shake again. If the wine is good in quality, a beautiful green coloration appears along the line of contact between the reagent and the mixture. If the mixture takes a pale green coloration, the wine has been diluted with water, and the amount of dilution is approximately measured by the varying paleness of the tint produced. If this pale green coloration becomes rapidly clouded and obscured, the wine has been diluted with water and colored with some coloring agent. If the mixture gives no color, or takes a grayish red tint, amaranthine or brick color, with no trace of green, the wine is compounded. In this last case the colorations vary infinitely, modified by the coloring matters used in the wine's fabrication.

Fruit Stains.—In the season of fruits, the napkins used at the table, and often the handkerchiefs and other articles, will become stained. Those who have access to a good drug store can procure a bottle of Javelle water. If the stains are wet with this before the articles are put into the wash, they will be completely removed. Those who cannot procure Javelle water can make a solution of chloride of lime. Four ounces of chloride is to be put into a quart of water in a bottle, and after thoroughly shaking allow the dregs to settle. The clean liquid will remove the stains as readily as Javelle water, but, in using this, one precaution must be observed. Be careful to thoroughly rinse the articles to which this solution has been applied in clear water before bringing them in contact with soap. When Javelle water is used this precaution is not necessary; but with the chloride of lime liquid it is, or the articles will be harsh and stiff.

Good Health.

Conditions of Health-Giving Exercise.

The summer air of the highlands makes outdoor life a luxury, but the chief advantage of the plan is this: The stimulus of a pleasant pastime enables a man to beguile himself into about ten times as much exercise as he could stand in the Turner hall. The visitors of a hygienic gymnasium take their turn at the horizontal bar as they would swallow the drugs of a public dispensary; they know that it is a lesser evil; they know that the road to Styx is the alternative; they intend to come every day, but the intolerable tedium of the crank-work exercise soon shakes that resolution. The motive for exertion is too abstract; it lacks the charm of progressiveness and the stimulus of a proximate, tangible and visible purpose. The sham competition of a regimeut of invalids under the command of a turnmaster does not much sweeten the bitter broth; it is still crank-work, minus the club of the jailer, and nine out of ten hygienic gymnasts will soon find or make a pretext for discontinuing their visits. How many out of a hundred pupils of a young ladies' seminary would dream of performing their "calisthenics" at home? They would as soon walk on all fours, or ride on a dry clothes-line. But arrange a May day pienic in the mountains, and they will beat a kid in climbing up the steepest rocks, and swing ou wild grapevines for hours together.

It is likwise certain that fatigues can be far better borne if the body is not incumbered with a surplus of calorific clothes. A pair of linen trousers, a flannel hunting shirt, and a loose necktie make the most hygienic summer dress. In the afternoon remove the necktie and roll up the shirt sleeves; it can do no harm to imbibe fresh air by all available means, and let the cutaneous lungs share in the luxury. Nor is there any excuse for the widespread fallacy that it is dangerous, even in the most sweltering nights, to remove the bed-blankets. Kick them into the farthest corner if they become too warm, and sleep in your shirt and drawers, or under a linen bed-sheet. Half-naked lazzaroni sleep the year round on the stone terrace of the Museo Borbonico, and outlive the asthmatic burghers in their sweat-box dormitories. The body effects part of its breathing through the pores. Painting a man with yellow ocher and copal varnish would kill him as surely as hanging him by the neck. The confined air between the skin of the body and a stratum of heavy blankets gets gradually surcharged with carbonic acid—in warm weather even to the verge of the saturation point. The perspiration is thus forced back upon the body, and the lungs, perhaps already weakened by disease, have to do double work.—*Dr. Felix L. Oswald, in Popular Science Monthly.*

Two Cholera Experiments.—If experiments on animals are prohibited, experiments must be made on human beings, and in their rudest form. The contrast between such rude popular experiments on man and scientific experiments on animals was illustrated in a speech of Dr. Lyon Playfair in reference to these two kinds of experiments on cholera. The first experiment was tried on 500,000 human beings in London, who were supplied with water contaminated by choleraic discharges, with the result that 125 out of every 10,000 consumers died from the effects of the experiment. In two other experiments made by another water company 180 died in the first experiment, and 130 in the second, out of every 10,000. These popular experiments on a large scale involved the sacrifice of half a million human beings. In contrast with this may be taken the scientific experiments made upon animals by Khiersch and others. These experments were made on fifty-six mice, fourteen of which died from the choleraic discharges. These were not mixed with water accidentally or carelessly, as in the popular experiment, but were administered under definite conditions, and the effect watched. The results of these experiments showed that water contaminated with choleraic discharges was deadly; the water so contaminated was avoided and an epidemic was escaped. *Nature.*

Italy a Malarious Country. Notwithstanding the health advantages claimed for a few localities in Italy, and the general reputation of the "Italian Climate," "Italian Skies," etc., that country is really one of the most, if not the most malarious country in the civilized world. Of the sixty-nine provinces of the kingdom, only six are nominally free from what is known as miasmatic or Roman fever, and in twenty-one the scourge assumes really serious proportions. Every year no fewer than 40,000 men in the army are attacked by the disease, and it is calculated that the prevalence of malaria necessitates the annual expenditure by the Government, of something like 10,000,000 lire, for the maintenance of special hospitals for public servants. It has been found that the extension of the railway system throughout the peninsula has increased the evil. The turning up of fresh, damp earth, and the unavoidable formation of new banks, deep cuttings, and excavations which speedily fill with water, breed the disease in its worst forms. On one of the railway lines which runs through much marsh land, the annual rate of mortality among the employes is thirty-six per 1,000.

A Boon in Ear Diseases.—Among the various cases of ear disease—numbering not less than fifty—at the St. Joseph's Industrial Home, Virginia, the most successful agent employed has proved to be boracic acid, as appears from the official statement by Dr. Minor. Boracic acid has the advantage of not being an irritant to inflamed surfaces, and its action on inflamed mucous membranes and granulations, presents, according to Dr. Minor, two stages. The first, he finds, gives rise to a sensation of slight warmth and moderate stimulation, and is associated with an abundant serous discharge from the succulent tissues, this gradually merging into the second stage, which is one of ease and relief, and is accompanied by a marked reduction in volume of the inflamed tissues, the diminution in size being evidently due to the depurative action of the swollen tissues during the first stage. The granulations were frequently noticed to shrink and disappear entirely under the influence of the acid, where removal by the snare and cauterization with nitrate of silver or nitric acid seemed to stimulate them to increased growth. The great proportion of cures by this agent, as given by Dr. Minor, is surprising.

How to Treat the Hands.—Soapsuds will not chap or injure the hands even if kept a long time in it, if on taking them from the suds they are thoroughly sponged, or dipped in lemon juice or vinegar. The acid destroys the corrosive effects of the alkali and makes the hands soft and white. Indian meal and lemon juice, used when washing the hands when roughed by cold or hard work, will heal and soften them. Vinegar will answer if lemons are not easily obtained. Rub the hands in this, then wash thoroughly, and if you have it, after drying put on a few drops of glycerine. Those who suffer from chapped hands in the winter will find this comforting, and will make sewing much easier.

A Good Country for the Doctors and Undertakers.—The following is clipped from an exchange and will prove interesting to persons who intend leaving for the Northwestern country: "The undertaking business flourishes at Portland and elsewhere throughout Oregon. What with malaria, quinine and whisky, and the debilitating effects of a long journey in steerage and emigrant car, Death's sickle reaps a large harvest, the children especially dropping off like rotten sheep. But still the Northwest is filling up, and everybody is confident about the grand time coming."

Fat is said by Dr. F. L. Oswald to be the best lung food, and among all fat-containing substances sweet cream is the best, salt pork the least nutritious. Consumptives should avoid all scorbutific articles of diet; salt meat, pickles, cheese, pungent spices, made dishes, and all intoxicating drinks.

Increase of Insanity.—Only eight insane asylums had been built in the United States in 1830–34, being State institutions; by 1840, sixteen were built; by 1850, twenty-four; by 1860, twenty-four; and by 1880, ninety, of which sixty-six are supported wholly or in part by State aid.—*N. Y. Herald.*

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Passing Events.

The telegraphers' strike still continues, and we have had local strikes among some of our typographical fraternity as well. The stevedores have struck, too, and some of the trades show a desire to do the same. No harm has been done here, however.

The news from the mines is generally good, though there is nothing startling to record. There seems to be a great deal of interest in copper this summer, and many prospectors are on the lookout for it. Numbers of copper smelting furnaces are being made and shipped to producing mines. Lead furnaces are plentiful here just now, also.

The results of the recent earthquakes in Italy were highly disastrous, some 3,000 or 4,000 people having been killed by the subsidence of the island near Naples.

IN Mint Director Burchard's report occurs the following: The mining outlook for Calaveras, with refcrence both to quartz and gravel, was never more flattering than it is to-day, and the assertion that this county affords greater inducements to those desirous of engaging in mining pursuits than any other section of the mineral belt will pass unchallenged.

J. W. DEGOLIA is said to have discovered on his land in the lower part of Grass Valley township a fine bed of "kolin," which is a clay much used by the Chinese and Japanese in the manufacture of fine porcelain wares. The deposit is believed to be extensive and very valuable. If there is enough of it a porcelain factory will be established there.

Rights of Relocators.

The laws of the United States very wisely provide that if a man locates a mining claim and fails to do certain specified work which shows he intends to work it, he loses it, and any man may relocate and own it. They, of course, protect the relocator as well as the original locator. Yet many miners seem to think there is a great difference between the relocator and the original discoverer of the ground. The rights of one are as strong as those of the other, a mere matter of detail in the drawing of the papers proving title being the only difference. One individual of a company may relocate the mine in his own name, if annual requisite expenditures have not been made by the company. An applicant for patent, who, a co-owner, relocated a mine in his own name, as single proprietor, is not obliged to show title back of such relocation; but if the proceedings are otherwise regular, and his former co-owners or other parties fail to arrest an adverse claim, patent may issue in the applicant's name.

This is a ruling which the Interior department has just made in overruling the decision of the Commissioner of the Land Office. In the case in question, the original location was made in 1864, and after numerous transfers the applicants for patent claimed the possessory title. They also made a relocation in 1880, covering the same ground, and using the same name under which the mine was originally located.

The certificate of relocation set forth, among other things, that it was made without waiver of any previous rights, and to secure all abandoned, interfering or overlapping claims. They finally admitted, however, their inability to show by abstract their title under the original location, and hence claim under the relocation of 1880.

The Commissioner of the General Land Office then decided that a relocator must show a complete and unbroken claim of title from the original locator, ending in himself, or prove abandonment of the property by the original locator, or his grantee; also, that relocation, using the same name under which the original location was made, coupled with the attempt to furnish abstract of title from the orginal locator and grantees, shows that applicants claim as purchasers for valuable consideration, and therefore that the relocation confers no new title upon them.

From this the applicants appealed to the Secretary of the Interior, who does not concur in these conclusions. Generally he can see no reason why a locator should be called upon to furnish any facts or data relative to a previous location upon the same ground, or why any inquiry should be instituted relative to antecedent matter, except upon showing of irregularity and of injury to material interests. The law applicable to adverse claims provides how and when such showing may be made in case any rights are liable to be infringed. In this case, applicants, by their admission of inability to furnish complete abstract of title under the original location, as required by the Land Office, virtually waive all claim based upon said location, and rely solely upon their relocation.

None of the apparently adverse interests filed claims of any kind. The right of re-location was never questioned. All claims before the re-location might be considered as abandoned. It has been before decided that failure to assert an adverse claim during the period of publication required by statute, amounts to a waiver of all adverse rights. As there were no adverse claims the question, in this case, was solely between the applicants and the United States.

The proceedings under the re-location, were all regular, and the purchase money was tendered to the government officials and accepted. Final certificate of entry was issued when the Land Office stopped proceedings for the reasons given above. The Secretary of the Interior, however, could see no reason why patent should not be granted under the re-location, even with same name and all. He concludes: "If applicants based their title solely on their rights as purchasers, the regulation of the Land Office might call for consideration; but I find no rule or regulation, and no law, which, on the facts, as they appear, would operate to prevent the issuance of patent on the location by the parties themselves."

INDICATIONS point to preliminaries looking to a commercial treaty between Great Britain and Mexico being shortly instituted.

Molten Lead for Amalgamating.

The employment of molten lead for extracting the precious metals from ores or earthy matter is old or well known. All fire assays and smelting, or other modes where heat is employed, depend largely for their success on the absorbing power of lead and its capacity to alloy with and retain gold and silver. Many methods of using lead for this purpose on a large scale have been the subject of patents. Some years ago, quite a number of inventors were at work in this direction, but with ill success. The exposure of the ore to the action of the lead is made more perfect in many cases by the use of deep lead baths and by various devices for retardation while the ore is rising to the surface. When the ore is introduced by force it is usually formed into masses, and while submerged these masses remain without complete disintegration, and rise to the surface in that condition. It is obvious that the interior portion of these masses of ore is not brought in contact with the lead. One of the requisites of success is to secure the introduction of the pulp, or ground ore, separated and diffused, and with all its particles as widely asunder as possible, and to keep them in constant motion while beneath the surface of the lead.

An inventor recognizing these facts, has devised a plan for disintegrating the masses of powdered ore while in the lead bath. The apparatus is constructed as follows: A flat-bottomed pan, made of iron or other suitable material, is set in an arch and provided with a tight cover. Through the center of this cover passes the hopper. The depth of the pan is about one-fourth its diameter. A stationary circular block of iron or other suitable material, is anchored or secured in the pan, leaving a space beneath it sufficient to permit the rotation of a wing-wheel or displacer. Through the center of this block is a hole, or well, with vertical sides, preferably curving outward at the top. Through this well passes a vertical shaft, driven by any suitable pulley, or otherwise, and carrying the displacer at its lower end.

When the lead is in a molten state, the surface is slightly above the well block. The displacer, or wheel, is now started and by its rotation, a vortex is formed within the well, by which the lead, or the lead with the ore floating on its surface, as the case may be, is caused to flow into and down through the well.

The powdered ore, dry and preferably heated, is introduced through the hopper, and the inflow carries the ore down through the well. Here the action of the wing throws the ore outward into the surrounding lead, not in masses, but, the inventor claims, completely separated and diffused. The motion of the displacer produces rotation of the whole body of molten lead beneath the well block, while the lead above the well block remains comparatively quiet, and this favors the steady influx of ore into the vortex of the well; and each particle of ore while rising by its specific lightness, is carried around and around many times beneath the well block, before it reaches the surface. Meanwhile the continuous rotary undercurrent caused by the action of the displacer prevents any aggregation of the ore into masses, by constantly sweeping over the under surface of the well block and the sides of the pan. The interior of the pan and the underside of the well block are smooth, to prevent lodgment of the ore.

At the surface, being freed from pressure, the ore appears in its original pulverulent condition, and is immediately drawn into the vortex and submerged by the inflow, and thus continuously a given charge is passed and repassed through the lead, until the lead has absorbed and alloyed all the contained gold and silver.

When a given charge has been run, the displacer is stopped, and the tailings are removed from the surface through an opening at the side of the pan. An arrangement of sweeps or scrapers, attached to the shaft, can be employed for this purpose. When the lead is enriched as much as is practicable by repeated charges of ore it is tapped off and run into bars, or the precious metal taken out, or any suitable way.

It is contended that the use of a containing vessel in the form of a shallow pan permits the employment of a lead bath of little depth, so that the displacer can be run at a high speed with but little power, and the centrifugal action of the rotating mass of molten lead admits of a long submergence and a great lateral diffusion of the ore particles.

Brakes for Hoisting Engines.

The matter of the construction of the brakes for hoisting engines in mines, is a very important one indeed, as on the proper working of this part of the mechanism at the shaft the lives of many persons depend. Great care is, therefore, taken to have all the details of the brake mechanism of the strongest and most substantial character. Mr. Wm. C. Waters, of this city, has just patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, an improved construction of brake machinery, a description of which will interest miners.

The iron brake shoes are curved to the arc of the wheel in the usual way, and are shod with wood, the wooden blocks being secured to them in a substantial manner. The blocks are cut to fit into channels or grooves in the faces of the shoes, and plates secured by screws hold the blocks in place. The blocks form the inner curve of the shoe and cannot move toward the center without binding more closely.

The shoes are suspended on bars or links, the lower end of which rest on foundation blocks, which are united by rods, there being a brake-shoe on each side of the wheel. The backs of the brake-shoes are flanged at their edges so that the single bar which supports each shoe lies between the flanges, and bolts or shafts pass through the upper ends of the bars and through the flanges horizontally at or near their centers, so that the shoes turn freely on these bolts.

Vertical bars are fitted on the ends of the bolts or shafts which pass through the flanges, so as to stand outside the edge of the wheel rims and rods, extending across the sides of the wheel just above and below the center. This causes the brakes to act directly toward the center of the wheel. An arm is fitted on the shaft or bolt, and projects horizontally outward and is connected by a rod with the lever by which power is applied. The inner end of the arm has a toe projecting downward, and when the outer end of the arm is drawn down it brings this toe into contact with the back of the brake shoe and presses it against the wheel.

The slot through which the bolt or shaft passes allows it to move back as pressure is applied, and the side rods draw the opposite brake shoe against the wheel upon that side, thus gripping the wheel firmly between them. When the brake is released by lifting the arm upward the toe is thrown back and strikes a lug which is formed on the back of the brake shoe, and thus draws or stands this shoe back, the slot in the shoe allowing the side bars enough motion to permit the opposite shoe to fall away and leave the wheel free from pressure.

Adjusting screws pass through lugs which project from the lower ends of the brake shoes, and when the brakes fall away from the wheel these screws will strike the suspending links or bars, which prevents the lower end from swinging back far enough to throw the upper end in and cause it to rub against the wheel. Set screws are placed in such a position that they regulate the distance that the brake falls back.

THE report for the last quarter of the output of the mines whose ore is shipped from Leadville is published in the *Herald* of that city. The tabulated results show that there have been mined 18,078 tons of lead, 2,413,665 ounces of silver, and 4,877 ounces of gold. At an estimate of $90 a ton for lead, $1.10 an ounce for silver, and $20 an ounce for gold, the aggregate value is $4,279,515. For the preceding quarter the value was $8,662,062, so that the product for the first six months of the present year is $7,942,447. The value of the output for the corresponding period last year was $7,822,390. There has, therefore, been an increase of $120,087. This is not a large gain, but when it is taken into consideration that the Harrison smelter and the Tahor stamp mill, two of the largest establishments of their kind, were destroyed by fire during the intervening period, the increase is fully as great as could have been expected.

IN a bend of the Merced river, above Red Banks, a considerable body of chromic iron is known to exist. The difficulty of transportation makes the mineral deposit of little present value.

THE *Lodi Review* has donned a new dress and now appears in eight-page form. The *Review* earns the good opinion in which it is held.

Foundry Notes.

At the Pacific Iron Works in this city they have recently been making a number of smelting plants, both for copper and lead, all being water-jacket furnaces. Among those lately shipped was a thirty-ton lead plant for Owen's River, Inyo county. This is a new enterprise under the auspices of W. P. Miller, of Castle Dome. A 30 ton copper plant has been sent to Copper City, New Mexico; a 40-ton galena plant to the Ruby Mining Co., Bullionville, Nev.; a 30-ton galena plant to the Hawley Mining Co., Inyo county; a 10-ton copper plant to the Two Republics mine, Lower California; a 30-ton copper plant to the Yaqui Mining Co., Sonora, Mexico, and a 30-ton copper plant to the Copperopolis Mining Co., Arizona.

From the Chicago shop of the Pacific Iron Works they have been shipping some smelters also. A thirty-ton plant went from there recently to the Eureka Mining Co., Copper City, New Mexico; another thirty-ton plant went to the H. O. W. Mining Co., at Deadwood, Dakota; a thirty-ton copper plant to the Canyon City reduction works, Colorado, and a twenty-ton galena outfit to the Star Mining Co., at Galena Colorado.

At the works in this city they have recently built several more of the Wheelock engines, a type now becoming very popular and standing in the front rank of first-class engines. A 100 horse power engine of this type, 16x36, was recently made for the Oakland Hosiery Co.; a 24x48 for the Welch flour mills, at Stockton, and a 26x48 for the Portland, Oregon, flour mills.

They are doing quite a lot of work on the U. S. steamer Monadnock, being built under contract at Mare island. They are furnishing the propellers, shafts, etc. They are also turning out quite a number of the Baker horse power mining hoist. This seems to be in great demand, answering its purpose excellently. We recently illustrated and described this machine in the PRESS. With it, one horse will handle about 1,000 pounds at the rate of 12 feet per minute. A 60-ton Howell furnace lately built at these works was shipped to the Qusi mining company of Sonora, Mexico.

Minerals in Counties

The State museum is now being re-arranged on a different plan from that heretofore existing. The ores and minerals of a certain character have been grouped together so that one looking for ores, of mercury for instance, could see all the varieties in one case, with the localities marked. It was thought this was the more convenient plan for reference. When the idea of a special exhibition of minerals during the conclave was broached, it was decided to ask the counties to contribute as counties. In the course of the work it was thought best to remodel the museum and class the ores and minerals by counties.

Thus one wishing to see what was found in Inyo county could see in a case, or set of cases, all the varieties of mineral products from that county. The collection will be divided, therefore, not into ores and minerals, but counties.

In some respects this arrangement will be of benefit. In the first place, it is hoped that when this plan is carried out the counties will take more interest in the Bureau and assist their respective localities by contributions of various kinds. It is thought that this will result in much more elaborate collections representing the mining interests of the State than we have before seen.

The citizens of the various counties cannot afford to have their localities unrepresented. They will make special efforts to collect and forward specimens of all their mineral products, and see that a creditable display is made.

Moreover, in the minds of some persons, the arrangement by counties instead of by classes of ores or minerals is highly preferable. It seems to separate the mineral from the agricultural parts of the State. To the man in search of mines it gives the proper clue to the locality he seeks. He will soon recognize where certain ores or minerals predominate, and if he is in search of a particular class, can locate them readily.

At all events the State Mineralogist is now engaged in arranging ores and minerals at the State Mining Bureau on this system, and the public will soon be able to judge how it works.

Blasting in Mines—No. 2

The Radial System of Boring

The system of machine boring introduced by W. B. Brain, is known as the radial system, the fundamental principle which constitutes its distinctive character being to make the holes of a series to radiate from a fixed point. The object of this radiation is two-fold; namely, to utilize the face of the heading as an unsupported side, and to reduce to a minimum the time consumed in changing the position of the stretcher-bar. It is evident that if the holes

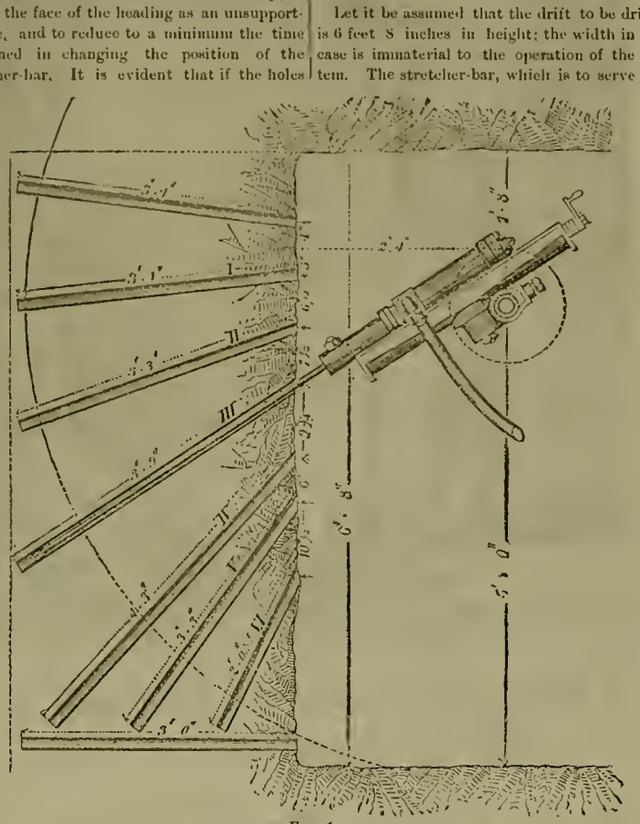


Fig. 1.

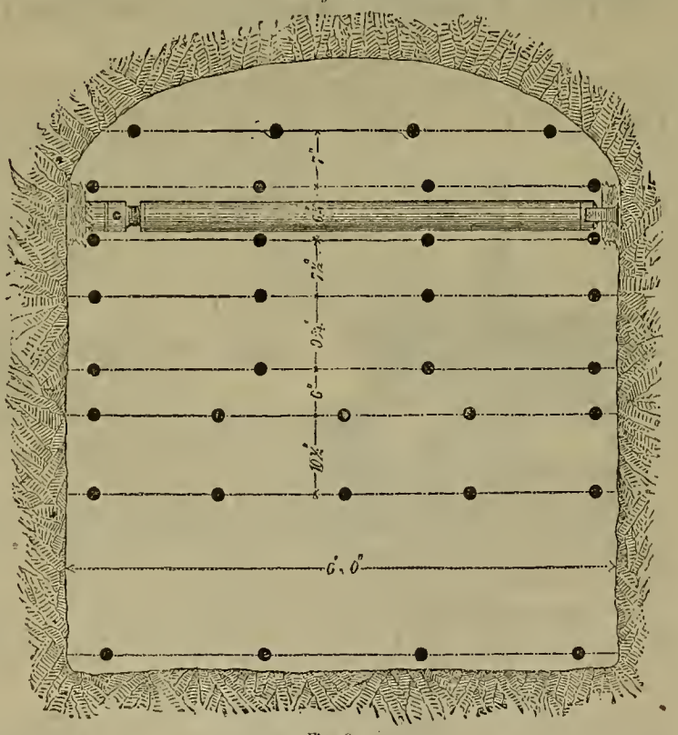


Fig. 2.

THE RADIAL SYSTEM OF BLASTING IN DRIFTS.

are made to radiate from a fixed point, and the horizontal position be avoided, none of them can be perpendicular to the face of the heading, and consequently the lines of fracture from each charge tend to reach the face.

A consequence of this fact is that no unkeying of the face is necessary, since each shot tends to blow outwards. Thus the labor of specially angling the center holes for this purpose is wholly saved. On the other hand, as all holes have to be set at regular angles, additional time is consumed in setting the machine. There still remains in favor of the system the time saved in changing the position of the machine support. The end proposed by the designer has been attained in a degree that gives to the radial system a high practical importance. The advantages offered by the system will be best appreciated by a description of the manner in which it is carried out, and which we take from Andre's treatise on "Coal Mining," published by Spon, of London:

Let it be assumed that the drift to be driven is 6 feet 8 inches in height; the width in this case is immaterial to the operation of the system. The stretcher-bar, which is to serve as a support to the machine, is fixed at a certain height from the floor, and at a certain distance from the face, as shown in Figs. 1 and 2, of the engraving. The height of the bar above the floor, with slight modifications to suit existing conditions, will be the same in all cases; but the distance of the bar from the face will be determined by the length of the machine, or at least by the distance from the centre of the clamp to the end of the piston-rod into which the bit is fixed. It is obviously desirable to reduce the distance between the face of the heading and the stretcher-bar to the least possible, since the angle of the holes will rapidly increase as this distance is diminished.

When the stretcher-bar has been fixed in position, as shown in the drawing, Fig. 2, the boring is commenced, from instructions previously furnished by the engineer in charge. The number of holes to be bored is determined by him, in accordance with the toughness of the rock and the strength of the explosive to be used, and when once the position of the holes have been thus determined they are required to be strictly adhered to, irrespective of joints, fissures due to former shots, irregularities of the face, or any other circumstances that may exist peculiar to the case. Thus the exigencies of machine labor are sought to be complied with rather than those of least resistance in the rock. The instructions furnished to the men respecting the boring of the shot-holes are drawn up in the following manner:

INSTRUCTIONS. HEADING, AT COLLIERY.

Stretcher-Bar.

Stretcher Bar to be fixed..... ..	1	ft.	8	in. from top.
" " "	5		0	" bottom.
" " "	2		4	" face.

Holes.

I.	3	in. down from level	3	ft.	1	in. deep.
II.	6¾	" " last hole..... ..	3		3	"
III.	7½	" " "	3		9	"
IV.	9¾	" " "	4		3	"
V.	6	" " "	3		3	"
VI.	10½	" " "	2		0	"
	Bottom hole from last hole.....		3		0	"
	Top hole, 4 in. above level.....		3		2	"

The instructions here show that after the stretcher-bar has been fixed in the position indicated, the top hole is to be started at a point 4 inches above the level of the machine; that is, 4 inches above the point upon which the bit would strike when the machine is in the horizontal position. This position is shown by the dotted lines on the drawing, and the point in which it meets the face is that from which the measurements are taken. The drill is therefore directed upward until its edge would strike a point situate 4 inches above this, and the hole is bored in that direction to a depth of 3 feet 2 inches, according to the instructions. It will be seen from figure 2 that a series of these holes is bored across the face; this series will thus be all of the same depth and in the same plane.

The holes marked I on the key section, furnished with the instructions, are to be started 3 inches down from level, that is, 3 inches below the point at which the horizontal lines meet the face. The machine is therefore directed downward until the bit would strike the face 3 inches below that point, when it is clamped in position. The hole is then bored to a depth of 3 feet 1 inch, according to the instructions, at which depth the bottom of the hole will be in the same vertical plane as that of the holes in the top series. A series of these holes is also bored to the same depth across the face, as shown in the figure, all of which will be in the same plane. The instructions show that the next series of holes, marked II, are to be started from points situate 6¾ inches below the center of the holes in the series, 1, last bored. The machine is therefore directed downward until the bit would strike the rock at the required point; here it is clamped in position, and the hole is bored to the indicated depth of 3 feet 3 inches. This depth is sufficient to reach the same vertical plane in which those already bored terminate. These holes being repeated across the face, will form a series all of which will be in the same plane. The holes in the series marked III are to be bored from point situate 7½ inches below the centers of those in series II, last bored. The machine having been directed to these points in the manner described, the holes are bored to the indicated depth of 3 feet 9 inches to make them terminate in the same vertical plane as those above them. In like manner, all the holes in this series will be in the same plane. The remaining series are bored in the same way; that is, No. IV at a distance of 9¾ inches from No. III, and to a depth of 4 feet 3 inches; No. V, at a distance of 6 inches below No. IV, and to a depth of 3 feet 3 inches; and No. VI at a distance of 10 inches below No. V, and to a depth of 2 feet. It now only remains to bore the horizontal holes at the bottom to a depth of 3 feet.

If now we suppose these holes charged and ready for firing, it will be seen that the charges will have to be fired in the reverse order of the numbering. The series marked VI being first fired, that portion of the face which is situate in front of these charges will be brought out, because the angling of the holes is such that the lines of fracture will run to the face. The removal of this portion of the rock will leave that behind which the charges in the series marked V are situate, unsupported, and hence the explosion of these charges will readily bring out that portion of the rock. In the same manner, the explosion of the charge in No. V renders the conditions favorable to the action of those in No. IV. By the removal of the rock below series IV, the whole of the above is left unsupported, and hence the successive firing of the remaining series takes place under very favorable conditions. It is also evident that the same favorable conditions will exist in a still fuller degree if the whole of the series be fired simultaneously by the aid of electricity. This method of firing, and the use of a strong explosive, are necessary to obtain the full advantages offered by this or by any other system of deep boring. The radial system is one of the best of those which have been designed to comply wholly with the requirements of machine labor. It should be remarked that it is especially applicable in cases where the stretcher-bar is used with one, or at most two machines.

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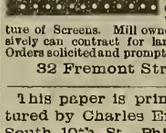
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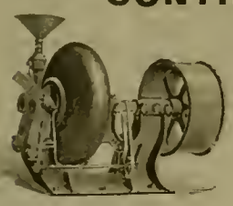
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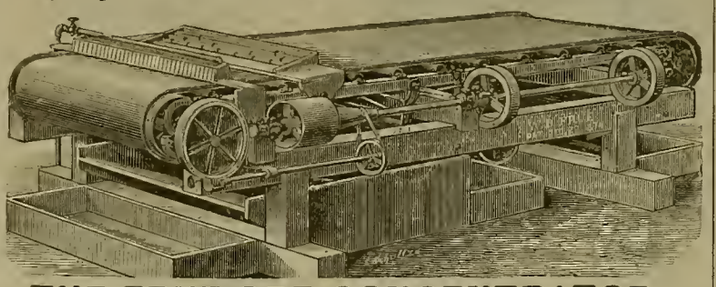
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That legal advice has been given that *all shaking motion* applied to an *endless traveling* belt used for concentration of ores is an infringement on patents held and owned by the Frue Vanning Machine Company.

That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.

That the patent laws make *users* of infringements responsible as well as makers, and the public is therefore warned that there is considerable risk in purchasing any end-shake machine until our various patents have been decided.

That if there are those who for any reason prefer an end-shake machine, we can manufacture and sell to such a machine of that description, as efficient as the Triumph, and at a lower price, and no liability for infringement will then be incurred by the purchaser.

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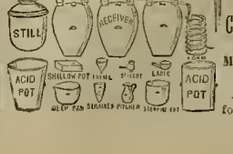
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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F

FOR WEEK ENDING JULY 24, 1883.

281,955.—TRUNK—John A. Ball, Oakland, Cal.
281,753.—WEIGHING SCALE — W. G. Collier, Merced, Cal.
281,986.—SULKY SCRAPER—P. Englehart, Stanislaus, Co., Cal.
281,987.—HARNESS TUG HOOK—J. E. Evans, Spanish Fork, U. T.
281,767.—CAN-FILLING MACHINE—M. Jenson, Astoria, Or.
281,883.—DREDGING MACHINE—L. A. & N. E. Johnson, Portland, Or.
282,005.—SASH FASTENER—McCloskey & Coleman, Walla Walla, W. T.
281,779.—CAR COUPLING—Frank Miller, Olema, Cal.
281,781.—HYDRAULIC ELEVATOR—W. H. Milliken, S. F.
281,718.—HAND ROCK DRILL—Parsons & Borchardt, S. F.
281,719.—ROCK DRILLING MACHINE—Parsons & Borchardt, S. F.
281,720.—MECHANICAL MOVEMENT—Parsons & Borchardt, S. F.
281,922.—ROCK DRILL—W. H. Randall, S. F.
281,801.—HEATING APPARATUS FOR CARS—I. Shirpser, S. F.
281,803.—APPARATUS TO PREVENT BOILER EXPLOSIONS—L. Simpkins, Marshfield, Or.
281,945.—ORE ROASTING FURNACE — J. M. Thompson, S. F.
281,810.—BRAKE FOR HOISTING ENGINES—Wm. C. Waters, S. F.
281,816.—DRAWERS—Geo. Wittman, S. F.
282,024.—SAFETY DEVICE FOR BRIDGES AND ELEVATED RAILWAY STRUCTURES—J. W. Young, Ft. Moroni, A. T.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

WEIGHING SCALE.—Wm. G. Collier, Merced. No. 281, 753. Dated July 24, 1883. This scale for weighing purposes consists of a circular, self-balanced rim, having arms and a central hub with central knife-edge pivot upon which it may oscillate. The article to be weighed is suspended from a pivot at a short distance horizontally from the knife-edge supports, and a permanent counterbalance weight is fixed to the rim beneath the knife-edge fulcrum, with a corresponding index, or scale, at any convenient part of the rim, so that all weights within a certain amount will be balanced by the movement of a counterweight at nearly right angles from a vertical line through the point of suspension, and indicated by the scale. Weights above this amount are counterbalanced by disks of fixed values suspended from a point on the rim in a horizontal line with the fulcrum and point of suspension of the weight, these disks being their own registers of what they counterbalance, while the intermediate weights above this amount will be indicated upon the scale, so as to enable the operator to ascertain all weights within certain limits, without being obliged to move the counterbalance weights for each change. A pawl engages a rack upon the rim and holds the indicator at the proper point for each weight until released. In connection with this mechanism is employed an improved system of platform levers, which are connected with the weight suspending arm, and by which error of motion is overcome.

CAR COUPLING.—Frank Miller, Olema. Assignor one-fourth to N. M. Gordon and David Nye, San Rafael, Cal. No. 281,779. Dated, July 24, 1883. This is an improvement on a device of a similar character previously patented by the same inventor. It consists in a means for forcing back the guard and swinging the coupling bar to one side to uncouple the device, and is a means for adapting the coupling for use in connection with the ordinary link and pin. The object is to simplify the construction of the former coupling, as far as it relates to the means for uncoupling the device, and to adapt it to a more extended use.

CAN-FILLING MACHINE.—Mathias Jensen, Astoria, Oregon. No. 281,767. Dated July 24th, 1883. This invention relates to an improved machine for filling cans with fish preparatory to sealing the same, and it consists in a means for automatically supplying the fish and shaping it to enter the can, and a means for supplying the can and adjusting them to the filling spout or nozzle, compressing the fish into them, and finally removing them ready to be capped.

HEATING APPARATUS FOR CARS.—Isidor Shirpser, assignor to Paul Steck, S. F. No 281,801. Dated July 24, 1883. The object of this invention is to heat a train of cars by the introduction, through suitable registers in each, of air heated at and delivered from a single place in the train by simle and efficient means, whereby the danger of fire, in case of wreck, is avoided.

DRAWERS.—George Wittman, S. F., assignor to Dana Newstadter. No. 281,816. Dated July 24, 1883. This invention relates to certain improvements in drawers for underwear, and it consists in a means for re-enforcing or strengthening the crotch seam and front opening.

An Amalgamating Ore Separator.

Among the recently invented devices of interest to the mining community is an ore separator which operates on the amalgamating plan, and is intended to be placed behind a quartz mill, where the tailings may be passed through it. There is a washing cylinder-case having a flat base trough and a cover-section hinged together. At one end the cylinder has a full end wall, while at the discharge end, the base only is closed, the water and sediment flowing out at the open end of the cover-section.

A rotary shaft extends lengthwise through the central portion of the cylinder, and is journaled in boxes at the ends. To this shaft are securely attached ou opposite sides a series of inclined but parallel copper flume-blades, which have curved outer margins of elliptical form, moving, as the shaft is rotated, near the case wall. A base trough is cast at the bottom of the lower section of the case, and forms an offset. The trough is shallow and its floor is flat, extending from end to end of the case.

In the side walls of the trough are vertical grooves, in which are seated a series of transverse ribs, or riffles, these being made removable. The upper edges of the riffles are designed to lie quite near the margins of the flume-blades, so that the particles of gold passing therefrom will be quickly stopped in the interspaces, or cells between the riffles, in which quicksilver is placed. Near the closed end of the case is placed, in the cover-section, an entrance spout, or hopper, through which the pulp from the stamps falls into the case, falling on the first flume-blades of the series whereon the sediment is washed, and, as the blades turn and assume a vertical position, passes downward in the interspaces, the upper portion, however, being caught by the succeeding flume-blades and further washed, and again falling through the interspaces as the shaft rotates.

The broad rotating flume-blades are covered with quicksilver, and are designed to catch, during the operation, the lighter particles of floating or "flour" gold. As the heavier portions of the sediment fall from the flume blades through the interspaces, they are received by the riffles in the base trough, which prevent their rapid passage, so that the particles of gold therein, being of superior gravity, fall and are caught in the cells of the trough.

As the lower end of the case is closed at the discharge end by the half wall, the water cannot flow out under the mass and wash off the heavy particles of gold, but must overflow, passing over the half wall and leaving the valuable portions of the sediment therein, to be acted on again and again by the current and the rotating blades.

El Dorado County to the Front.

A very rich strike has recently been made in Greenwood, or Spanish dry diggings district, El Dorado county, in this State. The mine belongs to the Morrell Consolidated Gold Mining Company, but is not one that is on the market. It has been worked for over twelve years, and a few years ago Mr. Morrell obtained a controlling interest. It has been worked in a small way, and a tunnel 120 feet long has been run. A mill is now being erected, it being expected that they would get $10 or $12 ore to work. Unexpectedly, however, they have struck on to very rich rock, from $1000 to $3000 per ton, and it is estimated by the owner that there is from $50,000 to $100,000 in sight. From a letter of the superintendent to the owner we take the following items:

"Two weeks ago what was pronounced a brilliant prospect has now ripened into reality. In other words, instead of a prospect you now have a gold mine. With a tunnel 120 feet long, and at a depth of forty feet, we have three parallel and continuous gold veins with an aggregate width of two feet, all thickly headed with free gold, and each yielding at a low estimate $1,200 per ton. Should the quality of these gold-bearing veins improve for fifty feet downward in the same ratio they have done from the surface to the present level, the yield of gold will be almost fabulous, and of this there is scarcely a doubt. In the north drift the formation is pronounced by experienced miners the best ever seen in this region. This drift is on quartz ore, and leads to a point under the old Johnson shaft, about twenty-five feet distant, where some exceedingly rich gold quartz was taken out, but abandoned on account of water. This point for which we are now drifting we have every reason to believe will prove even richer than the one now uncovered. In the north drift the indications promise to show something good at any moment."

THE commission appointed to investigate Belmont's charges of the frauds which he claimed were being perpetrated in the importation of sugar from the Sandwich islands, it is learned, will not sustain them fully.

ILL health generally comes from lack of the proper life orces in the blood. To restore the blood to a healthy state use Brown's Iron Bitters.

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ORE PULVERIZER.—The rotary ore pulverizer, advertised in another column as for sale by Mr. Heald, has been used but very slightly, and is a bargain to any one in want of such a machine. It is only sold because the company which ordered it is dissolved, and there is no possible use for it. All the necessary gearing, frame, etc., go with the pulverizer, which can be set running in half an hour after it is received. Parties needing something which will grind ore fine, will do well to communicate with Mr. Heald concerning this machine.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

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J. W. A. WRIGHT—Merced, Tulare and Kern counties.
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DON'T FORGET THE STAMP,—Always take a last look at a letter before posting to see that the stamp is in place Recently one of our agents in Los Angeles county found a letter containing $3 for one year's subscription to our paper, held for postage which the writer no doubt thought he had duly stamped, and but for the incidental finding of it by our agent, would of course have supposed we had received the money at the proper time. Let all subscribers when remitting or ordering their paper stopped be sure they duly stamp their letters.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions The pavilion has new varieties of performances. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

ADDRESS all corresponedence to the name of the paper or firm, as either of the publishers or editors connected with theoffice are quite likely to be absent at times.

ASSESSMENT NOTICE.

Seaton Gold Mining Company.—Location of principal place of business, San Francisco, California; location of works, Drytown, Amador county, Cal.

NOTICE is hereby given that at a meeting of the Board of Directors, held on the 31st day of July, 1883, an assessment (No. 3) of eight cents (8c.) per share was levied upon the capital stock of this corporation, payable immediately in United States gold coin, to the Secretary at the office of the Company, Room 6, 523 California St., San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 5th day of September, 1883, will be delinquent and advertised for sale, at public auction, and unless payment is made before, will be sold on Thursday, the 27th day of September, 1883, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. A. MARTIN, Secretary.

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News in Brief.

The treaty between France and Tunis was submitted to the Chamber of Deputies August first.

Mitchell won the toss for choice of ground for his battle with Slade at some place near Kansas city.

Carey, the informer, met death at the hands of one O'Donnel, who shot him on board the steamer in Algoa bay, Africa.

Clifford Lloyd has been appointed Secretary to the Local Control of Representation of the British Government in Egypt.

The display of the Louisville Exposition, which was opened by the President Aug. 2d, exceeds in fullness the hopes of the most sanguine.

The demoralization of the telegraph service, owing to the strike, is reported quite complete; in many eastern cities, business is entirely paralyzed.

The *Standard'* correspondent at Cairo says: "There will probably be heavy death returns from Alexandria shortly when secrecy is no longer possible."

Mount Vesuvius is in a state of eruption, and lava is descending from the crater in the direction of the town of Torre del Greco, at the southwest.

Officer Michael Foley, who was arrested in this city, in consequence of the result reached by the coroner's jury, in Shannahan's case, was released on furnishing bail in the sum of $5,000.

The immense bridges spanning the Brazos river and canyon, on Paita Pinto Mountains, about seventy-five miles west of Dallas, built by the Texas Pacific, were set on fire last Monday night.

The jury returned a verdict that Captain Matthew Webb came to his death while attempting to swim the whirlpool rapids of Niagara river, but the immediate cause the jury is unable to determine.

There is still some uneasiness among Boston firms in anticipation of other failures which might follow the recent suspensions, but none were announced except that of Macomber and Greenwood, and there is a feeling that the worst is over.

The Oroville *Mercury* says: Capitalists are at present projecting a scheme, which, if carried into effect, will make Oroville one of the greatest mining centers in the world. This project is neither more nor less than the organization of a company who propose to mine Carpenter's Flat to the bedrock. It is a well-known fact that the entire flat is rich mining ground, but as yet no adequate method has been employed to get rid of the water, which is encountered a short distance from the surface. The new company propose to work it by means similar to those in operation in the silver mines on the Comstock lode. Powerful pumps are to be placed at different points and it is believed that all the water can thus be got rid of. The working of this vast gold field will necessitate the employment of thousands of men. We are not at liberty to divulge the names of the projectors, but can state that they are very wealthy and we are assured that their plans will be put in operation at no distant day.

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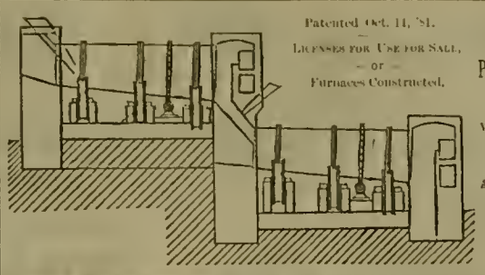
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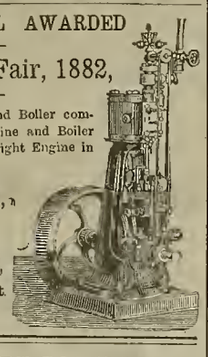
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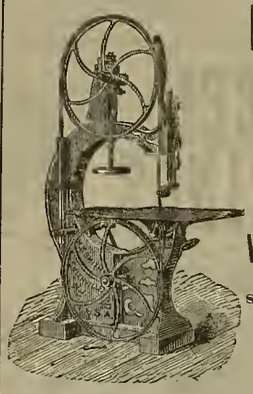
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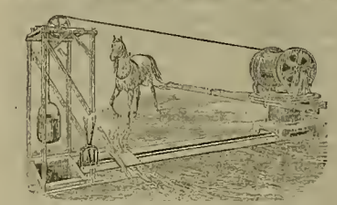
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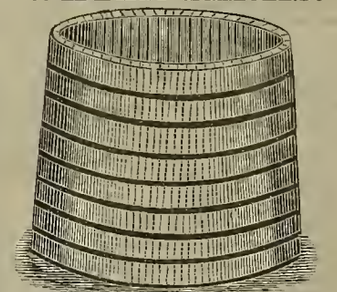
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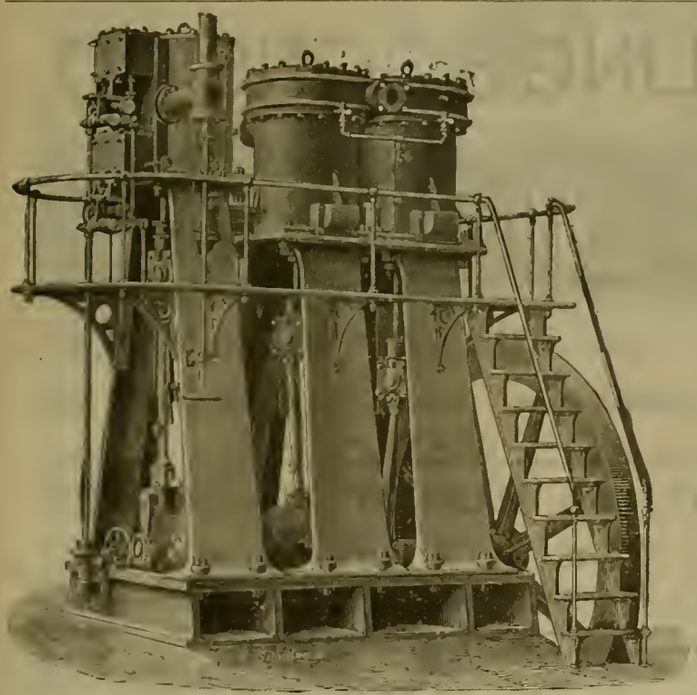
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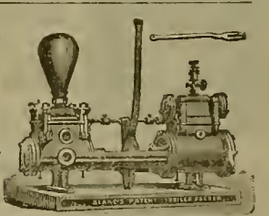


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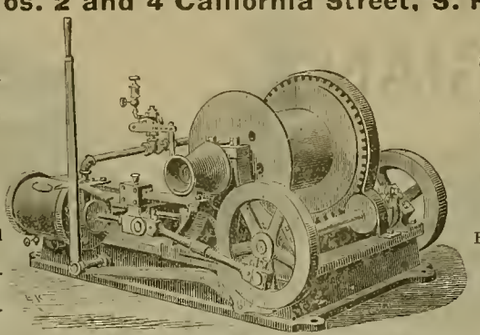


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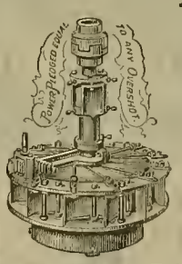
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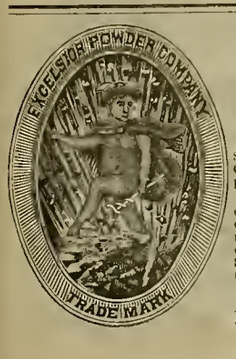
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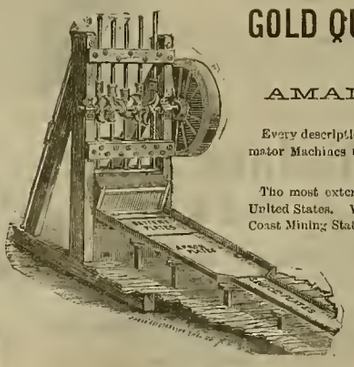
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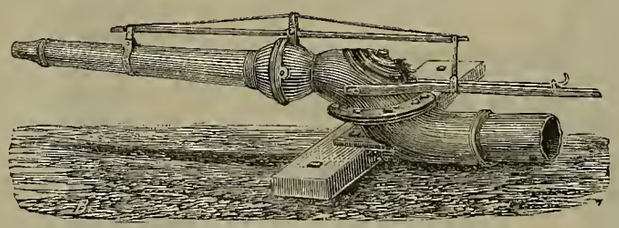
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—OF—

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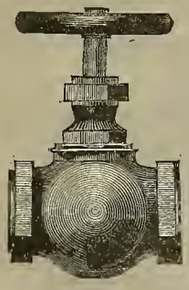
We call the attention of those using or interested in Hydraulic Mining Machinery to the above cut of an improved form of Hydraulic Giant, in which it will be observed that the Deflector and heavy weighting rear part are abolished and a lever attachment, working with a ratchet and pawl substituted, by which the pipeman, standing in the rear of the machine, has, without danger of "bucking," full control of the direction and effect of the stream. In an action in the U. S. Circuit Court, entitled F. H. Fisher and Joshua Hendy vs. Richard Hoskins et al. of the Marysville Foundry, a permanent injunction has recently been ordered against all persons manufacturing or using any form of Hydraulic Machine having the equivalents of the above.

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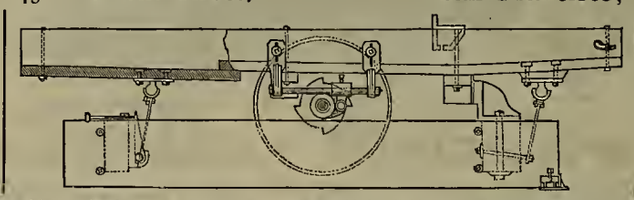
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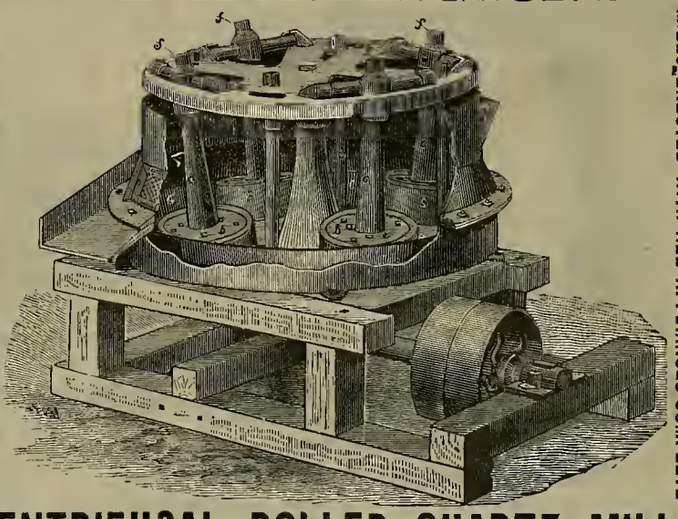
CONCENTRATOR

This machine requires less power, less care or attention, and is less liable to get out of repair than any concentrator now in use. All of which any practical miner will comprehend when seeing it in operation.

The wear and tear is nominal, and the construction so simple that any miner can put it up and run it; and the low price brings it within the reach of all mill men, as it will save enough to pay for itself in any mill in a very short time. One machine will concentrate the tailings from a five-stamp battery.

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CAPACITY AND DURABILITY GUARANTEED.



MILLS ERECTED WITH ALL APPLIANCES COMPLETE.

CENTRIFUGAL ROLLER QUARTZ MILL!

After running one of these mills on the Whidden mine, in El Dorado county, over four months, and thoroughly testing its capacity and durability, I am prepared to offer it to the mining public, and claim for it the following advantages over the drop stamp mill:

1. The cost of same capacity is not more than one-half that of stamps.
2. Freight to mine one-fourth that of stamps.
3. Cost of erection at mine one-tenth that of stamps.
4. It runs with one-third the power per ton of ore crushed.
5. The wear is less than that of stamps.
6. The wearing parts are easily duplicated.
7. It has a much better discharge, and leaves the pulp in better condition for concentrating.
8. It is a better Amalgamator, saving fully nine-tenths of the gold in the mill; the balance can be saved on plates in the usual manner.
9. It is continually crushing; not like the stamp, using power to suspend it in air ninety-nine one-hundredths of the time, and the balance making a thundering noise, and accomplishing *comparatively* small results. It is as far in advance of the stamp mill as the present method of making flour with improved rolls is over the Indian's mode of crushing corn in a stone mortar.

F. A. HUNTINGTON, ESQ.—DEAR SIR: Your Centrifugal Roller Quartz Mill has run on the Whidden Gold Mining Company's property, at Shingle Springs, El Dorado county, Cal., about four months, and it did good and satisfactory work; a greater portion of gold remaining in the mill than in a stamp battery.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, AUGUST 11, 1883.

VOLUME XLVII Number 6.

A Square Amalgamating Pan.

We examined this week the square amalgamating pan for amalgamating the ores of gold and silver, which was recently patented through the MINING AND SCIENTIFIC PRESS Patent Agency by G. W. and W. L. Strong, of this city. An engraving of the pan is shown on this page. The object of the form of construction is to produce a more perfect and constant circulation by means of the angles formed by the shape of the pan within which the muller revolves.

The upper part of the pan is made square in horizontal sections, though the center is a hutton core, through which projects the shaft which rotates the muller.

When the muller is set in motion, the current of pulp will flow outwardly until it strikes the corner of the pan, where it will be arrested and thrown back upon itself from above, passing down the center and beneath the muller and grinding shoes.

To produce the most perfect circulation, the lower corners of the pan are cut inward so as to make the corner faces, which are flat. This gives the bottom an outline, nearly octagonal, as shown by the cut, with the sides sloping upward from it; so that when the pulp flows out from beneath the shoes it strikes these faces and is thrown upward, so there is a strong downward current at the center and upward at the sides. The angles of the pan then make a rapid and constant circulation of the pulp.

The muller is open, and never has to be taken out for cleaning up. The center may be got at with a brush. In construction, these pans are quite simple. They separate the pulp direct and even. The pulp, reacting on itself in the peculiar manner described, causes a breaking up and mixing of the whole charge at once. At No. 10 Stevenson street these pans may be seen in operation daily. Three sizes are made. No. 1 has a capacity of 50 pounds, No. 2 works 500 pounds, and No. 3 takes 2,000 pounds per charge.

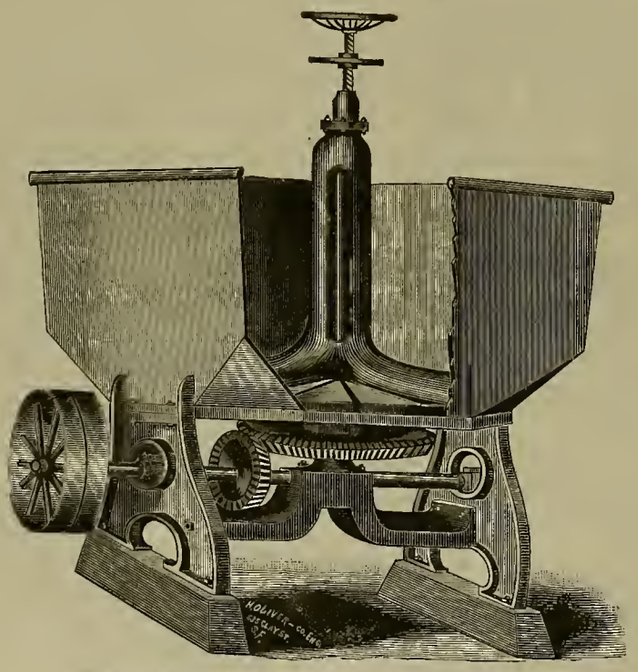
STRIKE NEAR VIRGINIA.—A despatch from Virginia, Nev., on the 8th, says: Specimens of ore of several pounds weight were to-day brought up from the Keyes and Wheeler mine in Seven-mile canyon. These were taken out of the bottom of the shaft since yesterday, and show both black sulphuret and chloride. All old miners consider the ore very strong in appearance, as well as of the richest character. An assay sample to-day went over $2,600. The streaks now cover a space of some three feet at the bottom of the shaft. There is every indication that a valuable deposit of ore is about to be developed and there is much excitement about the strike in this city.

CALAVERAS.—Dr. J. A. Griswold has bought the hotel, residence, etc., at Glencove, Calaveras county, formerly owned by Mr. A. Lasey; also the quartz mine called the Eldred. He has also located a mine and named it the Victoria, within a mile of the village. Both mines give good prospects, and in due time they will be worked for all they are worth.

NOTWITHSTANDING the high stage of water in the Carson river, it is said that the Gold Hill mines will not be reopened for some months to come. The present increase in water will barely suffice to crush the large quantity of ore now stored at the mills, and it is not considered advisable to again reopen the mines until the mills are fairly able to handle their average supply.

A Copper Smelting Plant.

It is very often the case that miners ordering mills or smelters, find, when they have the main machinery all set, there is much more still necessary before they can start up work. There are always small things necessary for a complete plant for either smelting or milling, and only men of long experience can anticipate the wants, by having everything ready on hand when the first heat is made or the stamps first drop. Just at present smelting plants for copper, lead or galena-silver seem to be more in demand even than mills, and many of them are being turned out in this city by the foundries making a specialty of this class of work. Thinking it would be of interest to many miners to see what is really necessary for a complete copper outfit, we have obtained from the Union Iron works of this city, manufacturers of the Williams water-jacket furnaces, the specifications of a complete plant for a thirty-ton water-jacket copper smelting furnace. This includes a full outfit of tools and supplies for ten days' run, exclusive of fuel: One thirty-ton water-jacket thirty-six inches in diameter at base and forty-eight inches in diameter at top; one firebox boiler thirty-horse power; two vertical engines 8x8; one No. 2 and one No. 5 Cameron steam pump; one 8x10 Blake crusher; one No. 4½ Blake blower; two cast iron plates 4x4 and 1 inch thick; 600 fire brick; five barrels of fire clay; five barrels of fire sand, or ground brick; one redwood tank, 8 feet diameter, 7 feet 6 inches deep; 3,000 gallons capacity; six slag pots on wheels; six bullion molds on wheels; three iron wheelbarrows; two platform scales, 1,000 pounds; one charcoal fork; two scoop shovels; four long-handled square pointed shovels; one hoe; one warehouse truck; one bar octagon steel, 1½x14 feet; one bar 1¼x14 feet; two bars ⅞x8 feet; one bar 1½x5 feet; one bar 1¼x4 feet; two bars 1x4 feet; four bars ⅞x5 feet; one bar ½ by full length; two bars iron, ¼x6 feet; two bars ⅞x6 feet; two bars 1x6 feet; one bar steel, ⅞x1½ feet; one sledge hammer, 8 pounds and one 10 pounds; one blacksmith's hammer and one sledge; one hand hammer; one nail hammer; one hand axe; one mason's hammer; one mason's trowel; three screw-wrenches, 8, 12, 18, inch; one set of pipe tools, ¼ to 1 inch, and one set 1¼ to 2 inch; one sheet of iron, 3-16 inch thick; one sheet of ore ¼ inch thick; ten pounds of washers, assorted; one jack-screw, 1½x18; 100 feet 3 inch manila rope; one set of blocks for same; one set of pipe tongs, ¼ to 2 inch; one bellows, 36 inch; one anvil; one 4 inch vice; one tuyer iron for blacksmith shop; three pairs blacksmith tongs; chisels for anvil; six cold chisels; two pounds copper rivets, ¼ inch; punch and rivit sets; one dozen files; one set of taps and dies, ⅜ to 1½ inch; one ratchet drill and bits; one soldering iron; one hand saw; one carpenter's square; one carpenter's level; six pounds sheet packing, ⅛ inch thick; six pounds hemp packing; four pounds Tuck's packing, ¼ to ½ inch; three balls candlewick; one side lace leather; four pounds copper wire, No. 16; one case lard oil; one case coal oil; twenty-five pounds red lead; one gallon boiled oil; two oilers; four hand lamps; four lanterns; three yards of canvas hose, 12 inch diameter; twenty feet galvanized iron pipe, No. 22, of size suitable for No. 4½ Baker blower; two round elbows for same; fifty feet of 1 inch hose with coupling and nozzle; 100 feet of 6 inch rubber belting; one length of gaspipe, ¼ inch; six of ½ inch; six of ¾ inch; six of 1 inch; six of 1¼ inch; ten of 1½ inch; 100 pounds of fittings, assorted, ½ to 1½ inch; four globe valves, 1½ inch; three of 1 inch; three of ¾ inch; three of ½ inch; 100 pounds of bolts, assorted, ⅜ to 1 inch; one grindstone; assay outfit.



STRONG'S PATENT SQUARE AMALGAMATING PAN.

THE Leadville smelters are all again at work, and there appears to be a free supply of ore.

Mine Managers.

The mining laws of Great Britain are so modeled that certificates of competency as colliery managers are issued under certain restrictions by official examiners to such persons as pass a satisfactory examination. Before submitting to the examination, however, the candidate must present testimonials as to capability, sobriety and general good conduct, and also prove that they have had at least five years' experience in connection with coal mines and colliery work. This system seems a very good one indeed, as mine owners are protected in, that they can demand certificates from those who ask for employment, and are not apt then to get incompetent men. The men, of course, have to have some "theoretical" as well as practical knowledge.

Previous to the examination, each applicant has certain written instructions from the secretary relative to the various subjects that would be placed before him, and therewith he was particularly advised that after entry and previous to proceeding with his examination paper, he must produce sample plan and section of certain colliery workings made by himself, from his own survey and the surveying book corresponding thereto.

An idea of what the scope of the examination is may be gained from the following statement of a recent one: The first subject was arithmetic, eight questions being asked, with a maximum degree of merit of 100 marks; surveying, geology, etc., eight questions, 100 marks; ventilation, ten questions, 110 marks; practical mining, thirteen questions, 150 marks; practical mining, thirteen questions, 195 marks; engineering, eight questions, 105 marks. On the whole, forty-seven questions, each question having a maximum, intermediate and minimum ratio of merit, as fifteen, ten, five, the highest standard on every subject being 660 marks; the lowest, which would admit the candidate to the *viva voce* or final stage, was 330 marks. In addition to this, the candidates are admitted one by one, so as to test their experience and practical knowledge by oral proof and demonstration. If everything is satisfactory, the men get certificates of competency; if not, they are rejected. When successful, they are recognized by the government as men fit to manage the colliery business of the country.

ACADEMY OF SCIENCES.—There were four papers read at the last meeting of the California Academy of Sciences on the subject of the now famous Carson footprints. The first of these was by Dr. H. W. Harkness. C. D. Gibbs, C. E., also read a paper on the subject, and one by Prof. Marsh, from the *American Journal*, was submitted. Prof. Geo. Davidson, President of the Academy, read a paper on these footprints, and this we shall give next week. A committee of the Academy has recently been to Carson to examine the present condition of the tracks. This committee consisted of Prof. W. P. Blake, Prof. Davidson and Mr. Gibbs. The expenses of these investigations have been borne by the income from the Crocker scientific investigation fund, which has enabled the Academy to accomplish much valuable work.

FROM January 1st to July 18th, the Horn Silver mine, of Utah, produced $1,835,500, out of which it has paid two dividends of $360,000 each, and expects to pay another soon.

CORRESPONDENCE.

Arizona Notes.

[From Our Correspondent.]

EDITORS PRESS:—The Dosoris, near Prescot, is still quietly proving up the value of mineral in Hassayampa district. Forty tons smelted at Howell's reduction works yielded $815 per ton; twenty tons sent East yieded over $1,800 per ton. Mr. P. A. Craigue, the superintentent of the company, is now at Howell's sampling another lot of twenty-five tons that will probably average about $800 per ton. This mine has a vein of about five feet, yields chlorides, black sulphurets, native silver and streaks of very rich galena. It is not a "speculation mine;" the Eastern capital invested seems to mean business and development, and not stock gambling. They intrust the management to one of large experience on the Pacific coast.

Col. Bigelow, owner in the Dunkirk mine, neighbor to the Dosoris, reports a large quantity of good ore in sacks to ship off for reduction. Will probably ship to San Francisco. It is grand ore that will pay sacking—"burroing," or packing on donkeys—to the main road, and then to be hauled twelve miles to Prescot; thence again by big wagon sixty miles to A. & P. R. R., or 150 miles by wagon to S. P. R. R. at Maricopa, and then over 800 miles to San Francisco. Yet for lack of funds many prospectors are thus sacrificing on their ores to meet their current expenses. But they expect much relief when the A. & P. road will get the Colorado river bridged, and can open it through for freight and allow a fair competition between San Francisco and Chicago traders and machine works, and also allow the coke men to shade down their prices to a living rate for consumers here.

"The Pine Spring" Bonanza mine of Turkey creek is improving and enlarging as they go down on the claim. Their shaft is now about thirty-five feet, and is yielding rich chlorides and specimens of native silver. The various extensions are also getting a fine chloride ore, and many parallel veins are doing work with excellent results. In Blind Indian canyon they are taking out very rich chloride ores. McCann & Co. are down over thirty feet; ore rich and improving. This district now has promise of producing a large amount of bullion in the next two years. They have regular mails at Bueno Post-office, and though they may send their ores to Denver or San Francisco, they will yet have a margin on their first and second-class ore above all expenses. B. W C.

Weiser District.

To Jas. Smith, who has been prospecting in the Weiser country, the Idaho *World* is indebted for the following items:

The country known as the Weiser district is situated on a spur (running south) of the Saw-tooth range. The Weiser river runs ou the east side of this spur, while the west is drained by Snake, supplying au abundance of water for all purposes. This spur is called the Cudy range, named after Mr. Cudy, who has mills and other property on this spur. Thirty miles from Weiser city is Mineral district. In this district are ledges of copper, gold and silver. The ores are of low grade, but with development will prove very valuable. Twenty miles north of Mineral is Heath district. There are some very fine prospects in this district, and a considerable amount of prospecting is going on. Fifteen miles further north is Galena district, which cantains as good galena prospects as can be found anywhere. This will undoubtedly be the richest district in the Territory. Some of the ores go seventy-five per cent in lead. Forty miles from Galena is the district of the "Seven Devils," or Seven Buttes, which is immeusely rich in copper; also carrying gold and silver. There are a great many locations in this district. I. I. Lewis has three locatious and has them pateuted. James Smith has two good locations. In Indian valley, on Little Weiser, Coruett & Steward have discovered a very large and fine bed of stone coal. Ou Hornet creek and Little Weiser there are placer mines that are being worked by I. H. Paddock & Co. and are paying well. As for farming, Smith says that he bas not seen anything to equal it in this country. T. B. Sams raises on his rauch, ou Crane creek, from 40 to 50 bushels of wheat to the acre; 70 to 80 bushels of barley; 40 bushels of oats; from 12 pounds of seeds 800 pounds potatoes; from one single eye, 5½ pounds of potatoes, average weight of potatoes, two pounds. All the ranches in this vicinity yield about the same. The stock range is of the finest kind, being like one continued meadow. There is an abundance of timber, not growing as high as the timber about here, but much straighter and with less knots. The farmers intend to cut a ditch running the water of Little Weiser into Crane creek, thereby providing water enough to irrigate every foot of land below the creek. In Indian and Counsel valleys the land is of the same kind, and the farmers and stock raisers are doing well. Persons who intend to farm need not ask where to get farming land. If they will go into the Weiser country they will in a very few years become wealthy and owners of valuable property, for in a short time the country will be thickly settled. Washington will be the richest—in farming, mining and stock raising—county in the Territory,

Northern Mexico.

Mining Operatione in the Sierra Madree.

The Tombstone *Epitaph* has enjoyed a pleasant visit from Dr. Samuel J. Moore, an old-time Arizonian, but who for the past eight years has heen a resident of Mexico. This is his first visit outside tbat country for the past six years, during which time he has principally lived at Trinidad, Sahuaripa district, the very heart of the Sierra Madres, although quite a distance below where Crook made his last "conquest." Dr. Moore is engaged in miuing, and in the course of an extended conversation the *Epitaph* reporter picked up the following points which may prove of interest: Large numbers of foreigners are coming into that country in search of mines, farms and stock ranges, and while matters are comparatively quiet,

Capital is not Hesitating

In making investments. At Morres, forty-five miles east of the Trinidad, on the east slope of the Sierra Madres, and in Chihuahua a ten-stamp mill is being put up by Messrs. Chas. Cunningham & Co., of Chicago. Part of the machinery is on the ground, and the rest en route, but as it has to be packed in, the process of transportation is necessarily tedious. The mine being opened by this company is called the Carmen, and is looking well. The lowest workings are about 200 feet, the ledge varying from six to eight feet, and the character of the ore brittle silver. From 500 to 600 tons of ore are on the dump. To

Jesus Maria

Is a distance of five leagues, in a northerly direction. The camp is lively, the Chicago companies operating mines, and at work with the erection of mills. A sawmill will also he put up by one of the companies, the country abounding in timber—magnificent pine, oak, walnut and other woods. The four mines now opened are very promising, while there are other favorable prospects comparatively undeveloped. This section, so Dr. Moore says, is one of the finest grazing countries he has ever seen. Many foreigners are in there, and they meet with no trouble in securing desirable lands. Six leagues north of Jesus Maria is Pinos Altos. The Pinos Altos mine belongs to

An English Company,

Of which Mr. Hepburn, a brother of the deceased John Hepburn, well known here, is the superintendent. A recent strike has demonstrated this property to be better than was ever before supposed, and the company is now at work enlarging their working facilities. The mill, which now bas sixty stamps, will be increased with forty more. Some 250 men are employed, which, outside of machiuists, foremen and other bosses, are principally Mexicans. The product of this mine is principally gold, and shipped to the Mexican Central road. This section is also well watered and timbered.

Uquiva

Is five leagues further east. Three mills have heen put up duriug the present year—two of 5 stamps each and the other of 10 stamps. The first two are now in running order. The mines are showing up most encouragingly, the character of the ore being carbonates. This section is attracting much atteution and large numbers of foreigners are coming in, securing mines, farms, timber lands and stock.

Coming back into Sonora again, and ten leagues west from Pinos Altos, the well known

Mulattos Gold Mine,

Owned by the Ware brothers, is encountered. This mill has 60 stamps, and from 30 to 45 of them are dropping day and night on remarkably rich ore. It is estimated that the mill yields from $18,000 to $24,000, clear of all ordinary expenses, every month. It is proposed to run the machinery by water power in the near future. There are other properties surrounding, but from here to Toracha nothing of importance is met with, save a vast mineral belt, which is principally owned by foreigners. There are a great many old workings in this belt, and in the bottoms of some of these are found very rich ore still exposed to sight. This

Mineral Belt

Even extends to Guadalupe, eighteen miles below Toracha. This country is one of the finest grazing sections to he found in Sonora. In the neighborhood of Guadalupe three Americans are engaged in farming, raising everything that can be produced in any section of the temperate zone. The Indians have made several raids through there, but the damage has always proved slight. So far as the Mexicans are concerned, Dr. Moore gives it upon his own knowledge, acquired in an eight years' residence, that they treat all foreign travelers and sojourners with the greatest hospitality and kindness, and when occasion demands, the people as well as the officials most readily render whatever assistance may he required.

The Trinidad Property,

Dons Padre (Godfather), is owned by Martias Alsuir, and is looking splendidly. The lower workings are at a depth of about 400 feet, and the ore encountered is richer than was ever found above, being brittle silver. A sixty-stamp mill crushes the same.

Sahuaripa

Is a town of about 2,500 population. The valley by the same name is very productive, all kinds of cereals, cane and vegetables being produced. It supports three flouring mills, and much pinocha is made. The steam flouring mill is owned by an American-German, Jacob Beveridge, who is also extensively interested in mining enterprises, having property that prospects splendidly. There are

Other Interests

Which Dr. Moore spoke about that we do not now remember. He stated, however, that an English company were buying a large scope of country from San Marcial east of the Yaqui river. On the lower Yaqui they also have a group of copper mines. Some encouragement has been received from an official of the Sonora railway that a line may he built from a point at or near Hermosillo, crossing the Sierra Madres near Sahuaripa and connecting with the Mexican Central system.

Reviewers have already been over the route, and surveyors are expected in a few months. The means of ingress now is by a wagon road from the Sonora road to Sinope, from the latter point to Sahuaripa the distance being sixty miles. This distance could be covered by a wagon road at a very trifling expense.

The Indian Question,

Dr. Moore said, has not interested the people of his section as much as might be supposed. The Apaches have, as a rule, heen operating on the western slope of the Sierra Madres, some seventy miles north of Sahuaripa, and their stronghold is probably over a hundred miles distant. He thinks Crook's expedition will prove beneficial, inasmuch as the Apaches will now fear attack from this side, an idea they never before entertained. As a general thing they do not hold the Mexican troops in awe. The mineral belt in which the mines spoken of are located, evidently extends into the Indian country, as mines that were worked by the ancients are to be found there.

Red Mountains.

James McBurney, who left Tem Pahute, Nye county, last February, accompanied by Dave Service, and went on a prospecting trip into the southwest corner of Colorado, came into Eureka Tuesday night on his return, and gives some interesting notes of the country and of some Eurekans whom he met in his travels. The place of the mining excitement that he and Service headed for horseback is what is known as Red Mountain, in the northern part of San Juan county. There was quite a rush into the district, miners and prospectors coming in all the time. When he left there were from 2,000 to 2,500 men on the ground. He says the formation of the country is sandstone, and that he saw nothing like ledges or veins, as we use those terms, but the ore occurs in pockets and spots. It is massive galena, carrying pyrites of iron. It is good in quality, but the quantity found so far has been small and uncertain. The mountains are high where the mines are and difficult of access. Freight is packed up altogether on "burros." It struck him as funny to see a load of hay coming into camp on the backs of a train of donkeys. Miners there get four dollars a day; the only place, he believes, in Colorado where they get as much. The few miners that have gone there have the preference in employment, as this State has a reputation for furnishing skilled mining labor. The snow in the winter is very deep, although the weather is not extremely cold. For a long time last winter the snow lay on the ground five feet deep. Silverton, the county seat of San Juan county, 12 miles south of Red mountains, is the northern terminus in that country of the Denver & Rio Grande narrow-gauge railroad, and is the depot from which supplies are obtained and through which travel goes. It is now a lively place. The country generally is fine in its farming and stock-raising resources, which enables mining that would not pay in these parts to be profitably carried on there. As it is, he thinks this country is away ahead of that for miners. On his way out through Nevada and Utah he did not see any mining of importance going on, his road being mostly through small Mormon settlements. On his way back he stopped a while in Taylor district, White Pine county, which, he says, is a lively little camp, with a fine prospect. He returned alone, Dave Service staying in the Red mountains until fall.

Mr. Porter, who used to superintend the K. K. mine on Ruby hill, has charge of the smelting works at Durango. The works have a capacity of reducing 30 tons per day, but are idle at present. Durango is on the railroad, in a fine grazing and agricultural country. Some ore is shipped a considerable distance to Pueblo for reduction at $10 per ton freigbt.

Mr. McBurney thinks there is no comparison between this country and that which he has been examining for the last three months. Miners can do better right here, he is satisfied, than they can there.—*Eureka Sentinel.*

AN IMPORTANT development has been made in the Quien Sabe mine on Cave creek. At a point 300 feet west of the principal development on the main outcrop, an open cut has been run in until the face of the cut is 11 feet high and then a shaft commenced, which, when the letter announcing the strike was written, was three feet deep, thus making it 14 feet to the bottom. The vein there is ten feet wide and exceedingly rich ore—rich in copper, gold and silver. In the open cut back of where the shaft was begun, it was eight feet wide. A sample of the ore sent in, is solid sulphide of copper and silver that will assay way up in both metals. Put upon the forge the metal runs out like so much oil. With the facilities for working this mine much interior ore to this last strike would pay very handsomely.—*Arizona Gazette.*

New Mines in Arizona.

Mr. C. H. Vosburg gives to the Tucson *Citizen* the following items about the new mines in the Quijotoa mountains. They are located about 90 miles nearly west from Tucson, and about 75 miles south of Casa Grande, with a much better road to this place. They were discovered about six weeks ago by a man named McKay, who had prospected that country all through some four years ago. The ledge is just six miles north of the water station on the Gunsight road known as Covered Well. A band of prospectors had been camping there, and found an abundance of float rock containing fine specimens. They kept up for a long time an unsuccessful search for the mother ledge. Where it was discovered was a curious freak of geological formation. On the top of a high mountain there rises the perpendicular walls of a rocky ledge about 400 feet high and from a mile to a mile and a half long. There is only one place where its summit can be scaled, and that is a very narrow and difficult way, that requires a half a day's hard work to get to its summit, which, once attained, is broad and level. McKay told his companions one day that he was going to climb to the top.

One of them remarked he would not climb up there if the top was covered with $20 gold pieces. McKay said he would get there if for nothing else than to "view the landscape o'er." After arriving at the summit almost the first thing he found was a good ledge of rich ore. Prospecting a little further around, he found a deep gorge, down which he descended about 100 feet. Here he found horn silver in abundance. Returning to his companions with his specimens, they could hardly believe their eyes. Locations were immediately made. A specimen out of the bottom of the gorge assayed $4,500 to the ton. The ore is said to be mixed largely with iron, and good either for milling or smelting. Lowering works have been established. A cable 600 feet long has been stretched from the summit of the great ledge to the side of the hill below, and a small car carries the ore down. Several tons are expected in Tucson to-day to be shipped to the smelter at Benson. About ninty men are there at present, and more arriving every day. Every foot of ground is being prospected for miles around.

Transportation of Ores.

The building of a railroad from the Silver King mine to a connection with the A. M. B. road on the Salt river, is more than a possibility. The inducements are many; the cost comparatively little. The road would not exceed thirty miles in length, and it could be of a twenty-four inch gauge. It would pass through the Pinto country and open up its mines to speculation and working. Grades that are impossible to ordinary haulng power are overcome by a gauge as narrow as that mentioned. Three hundred feet to the mile is possible. By the building of such a road the Silver King Co. could have their reduction works on the Salt river, and could increase their capacity to any extent; they could transport ore to their mill as cheaply as they do now to Pinal; they could reduce it at a much less cost; they could get their lumber, firewood and mine timbers at one-third the present cost; owning their road, they could make their own rates; they look to the East as a market for their concentrations; they would, by the building of the road, be hundreds of miles nearer New York; they would be 200 miles nearer San Francisco; all of the costs under which they now groan would be reduced, and some of them removed; living would be cheaper, and so would labor. It would be an advantage to all the mining companies operating about the King and Pinal. It would send money into the Rodger's district, and bring the galena ores of Pioneer near enough to market to make it profitable to handle them. It will be to the country about the King what our road will be to us—its salvation. During the last year the freights to the King and Pinal were not less than a quarter of a million of dollars. All of that business would come to the A. M. B. road. It, with Globe and Pioneer, would make a volume of business that would be immense—sufficient, independent of what would of necessity grow out of the development of the country, to make the A. M. B. road a paying concern.—*Arizona Silver Belt.*

CHEROKEE.—In company with some San Francisco friends we yesterday had the pleasure of a visit to the Cherokee mine. The excellent gentleman who is superintendent, Mr. Garney Williams, courteously received our party and gave the visitors from a distance a most favorable opportunity of seeing the great mine at its best while three great chiefs were in operation. We have been in the mine a dozen times before but never saw it look better. The work seems to be going on in perfect order and very efficiently. Returning, met Mr. Wm. James taking life easy and enjoying the fruits of his earlier intelligent toil. Mr. Waldyer was at home enjoying his books and paper. All the excellent crew who are known to visitors as sturdy business men connected with this huge mine were at their posts. While in the mine, the ladies were delighted to be on hand when a blast of fifty charges was set off. The flood of water pouring into and through the tunnel and beating down the 300 feet of mountain side was a sight to be remembered. —*Chico Enterprise.*

MECHANICAL PROGRESS.

The Electric Light in the Machine Shop.

A correspondent of *Cotton, Wool and Iron* gives his experience in the use of the electric light in a machine shop as follows:

"I have used the electric light in my shop for the past three winters. I obtained the necessary apparatus in 1881 through doing some work for one of the electric light companies. When I first contemplated its use in the shop I had but little faith in it. I was afraid that it would spoil our eyes; that its sharply defined shadows would interfere; that the flickering and unsteadiness would be unbearable, and the first few days' experience seemed to confirm this anticipation. We soon learned that it was not absolutely necessary to look at it all the time, as most of the workmen seemed to think for awhile, and we very soon became accustomed to the light, and to learn that whatever little annoyances we experienced from the flickering were more than counterbalanced by the fact that the whole room was illuminated so that the men could go about, find tools, or do jobs in any part of the room as freely as in daylight. I am speaking of the arc light, and from my experience, and what I have seen of the incandescent plan, I prefer the arc light for shop use."

In regard to the supposed difficulty of working in the shadows, he says:

I have never experienced any such difficulty with my three years' use of this light in a shop working from twenty to thirty men, all on fine or small work, such as hand tooling, small brass work, turning, boring, mitering and drilling, or cutting fine threads, both external and internal. I have never seen a man light a match or use a hand lamp; and as for working under a lathe, I have moved twice in the three years, and in both cases have put the lights into operation the first thing, and have done quite a share of setting up the shop, even including hanging the main shaft at night, and if there is any one place where this light shows at its best advantage it is on just such a job as this. I think it almost goes ahead of daylight for this kind of work; it certainly would do so in many shops in Boston. As for its cost, I have never gone into that enough to give any accurate figures. Of course the power used to drive the dynamo is the principal cost, but in buying fuel for a twenty horse power boiler to furnish power, heat and light, I have never been able to separate the part belonging to the lighting so that I could feel it, and therefore, watever the real cost has been, it has seemed to be very cheap. In regard to the "flickering" he says that unpleasant feature is mostly confined to the use of a single lamp, while in a room filled with lights the flickering is not perceived, as there are no shadows to make it visible. It is like looking for shadows in the daylight. The sun, of course, casts a shadow, but if there were another sun on the other side there would be no shadow, and in a room supplied with a number of electric suns there will be no trouble from shadows.

Action of Mineral Oil on Boiler Scale.

A correspondent of *Cotton, Wool and Iron*, writes that journal as follows: "I will give you a little of my experience in using mineral oil in boilers. When I first took charge of the boiler where I am now I could not see between the tubes, they were so incrustated with a hard substance, principally lime. They had used every known compound up to that time without any effect. I took it in my own hands, and used mineral oil, and washed it out in two weeks, and was surprised to take out one and one-half bushels of scale. I kept on using it, and now have a clean boiler. The proprietor has some of the scale now that I took out five years ago, one-half an inch thick, eight and ten inches long, one-third around the tube. The inspector of the Fidelity and Casualty was here last Sunday, and said that I had the cleanest boiler on record. It is eighteen years old. This oil forms pebbles from the size of a pin's head to the size of a large marble, which are kept in action by the agitation of the water when boiling, touching the seale, and consequently releasing it from the tubes. I favor mineral oil, but not any other kinds, as they contain more or less animal matter which is injurious to iron. I can clean any boiler with mineral oil, and it will not start it leaking unless the boiler is all scale and no iron. The dimensions of my boiler are 56-inch shell, 16 feet long, 70 3-inch tubes, set up in brick. I burn shavings, and can raise steam from fifty to eighty pounds in ten minutes while running the engine and firing, besides heating two large kilns with live steam. My engine is Putnam make, 17x30 inches. I also run a No. 2 and No. 4 steam pump to feed boiler and pump water from canal for boiler and street sprinkler; so you will see, by the work my boiler has to do, that it must be clean to do it so easily. I only make two fires an hour, so you may take my word for it that mineral oil is just boss."

HYDRO-CARBON SMELTING is among the many industries in Boston. At the South Boston iron works, furnaces are being constructed which, it is said, will effetually settle the question of smelting the precious metals by the use of crude petroleum. The Ambler, Eames, Hayden processes have been tried with fair results on erude iron ore by the use, it is alleged by some, of refined petroleum. The cheapness of the crude oils of Pennsylvania having been somewhat tried experimentally and found to answer the requirements only in part, recent inventions are to be put to the severest tests, which the iron as well as the precious metal industry will await with the greatest interest.

Pulverized Fuel.

The use of pulverized fuel, which is also a process for utilizing coal waste, is still attracting much attention, both in this country and in England as well. Crampton, of England, has made some very practical improvements in this direction; but the following brief reference by Prof. Thurston, to the method successfully adopted by Messrs. Whelply & Storer, of Boston, will give a very good general idea of its character and capabilities. In this process, a stream of mingled dust fuel and air is driven into the furnace where combustion takes place, the quantity of fuel and of air being capable of adjustment in such a manner as to secure the most perfect combustion. This method has been applied successfully, not in the production of heat simply, but also in the reduction of metals from their ores. The facility with which an oxidizing or a reducing flame may be produced at will is the great merit of the process in the latter application. Its advantage for heating purposes lies in the power which it gives of utilizing a fuel which would otherwise have no value. In making "muck bar," an economy over that obtained with coal, of above twenty per cent, has been reported to have been effected by the use of this process and fuel. The saving occurred in reduction of waste of metal as well as in simple economy of fuel.

At the United States armory at Springfield, Mass., six and six-tenths pounds of iron were consumed per pound of iron heated to the welding heat, where sixteen had been required by the old process.

Mr. Wootou has devised a grate of peculiar construction, upon which to burn slack coal, etc. His system has been applied to both locomotive and stationary engines, and we believe with good results. It will be found described in the engineering papers of some three or four years ago.

MALLEABLE IRON CASTINGS.—After the pig iron is melted and molded into castings, these are cleared of sand by tumbling, use of acids and wire brushes, then placed in iron pots or boxes, the interstices filled with steel borings and ammonia, the boxes being hermetically sealed and placed in large ovens, also sealed and made air-tight. The ovens are then heated to 3,000 degrees Fahr., at which temperature they are kept from eight to twelve days. The carbon is thus extracted from the iron, escaping in gas. After remaining the requisite time, the boxes are removed and allowed to stand from one to three days, owing to the temperature, to cool before opening. The castiugs are then found to be thoroughly annealed, very tenacious, and stronger than wrought iron itself. In order to remelt this malleable iron, it must be subjected to a greater heat than 3,000 degrees Fahr., which is impossible to secure without a very powerful blast furnace. As an evidence of this the old malleable castings cannot be sold to foundries or furnaces for anything.

THE widening application of steel is a theme which is debated with close interest by the iron trade in all the centers. The latest novel application of that metal applies to gas-making purposes. At the Neepsend gas works, in Sheffield, the drum of a large station meter has been made wholly of this metal. The fact was referred to at the last annual meeting of the Gas Institute of Great Britain. It was pointed out by the president, that in the construction of purifier covers, ascension pipes, conducting and hydraulic mains, and condensers, steel offered great advantages, and for these purposes must ultimately supercede both cast and wrought iron. In this connection it may be remarked as a matter of much interest, that fifty years ago the United States made no steel to speak of, while we now make more than any other nation save England.

A CAST IRON FILE.—One of the interesting inventions shown at the recent Railway Exposition, at Chicago, was a cast iron file, the merit of which lies in its extreme durability as compared with the ordinary steel file. Scientists assert that in hardening cast iron brittleness and want of tenacity increase with the increase of hardness. In the file in question there is from three to four per cent of carbon, and the tenacity as compared with steel bears a ratio of six to one. It is claimed for the cast iron that it is a true carbide of iron, whereas steel is an oxidated carbide. One breath of air while the metal is being reduced to a true carbide reduces it to an oxidated carbide.

BENDING PUNCHED PLATES.—The practice of bending plates after they are punched is probably a frequent cause of fracture along the riveted joints, for the part of the plate which is punched is bent much more than the other part when the plate passes through the rolls, and no doubt incipient cracks are thus produced. Calking, in the ordinary sense of the term, is now rarely performed. A light hammer and light set-tool is used. By these a gentle swelling of the edge of the plate, commencing at the center of the edge, and practically no strain occurs to the riveting.—*Ex.*

SCIENTIFIC PROGRESS.

Telephonic Defects.

There is still much to be accomplished in the perfection of the telephone to make it meet all the demands of practice. For the purposes of communication at short distances it is indeed very serviceable; but when a certain distance has been exceeded, the present capabilities of the instrument are overtasked. In principle there is no limit to the capabilities of the telephone; and though we do not anticipate that the apparatus will ever be made perfect, we may reasonably expect that it will be so far improved as to make it serviceable for intercommunication between distances of several hundred miles. At present, on account of the imperfect character of the insulation of such lines, sounds sent over them rapidly lose their distinctness as the distance over which they pass increases. This is especially marked in the day time, and the practical limit of long-distance conversation is perhaps thirty miles. Under the most favorable conditions, at night, when the confusion of noises which interfere with the proper transmission of sounds is hushed, perfectly distinct siguals are sent and received over distances of 200 to 300 miles.

The reason for this peculiar behavior is to be found in the induction which one electric current exerts upon all others in its neighborhood and which it has thus far been found impracticable to entirely obviate. Thus the very sensitiveness of the telephone gives rise to one of the chief sources of trouble in its use. How susceptible the instrument is may be inferred from the following: If two telephone wires are suspended in the air twenty feet apart, a conversation transmitted over either line will be distinctly heard on the other; and telegraph or electric light wires exert a much stronger influence. Even the cut ends of the wires and the splicings of a telephone line are said to act as small transmitters, and to receive and forward the natural sounds which may be produced around them, such as the singing of birds or the croaking of frogs, so that a conversation over a wire of considerable length has, as it were, to run the gauntlet among the scraps of talk imparted from neighboring lines, the crackling and hammering due to induction from telegraph and electric light wires, and the vague murmur compounded of an infinite number of lesser disturbances; and it is not surprising that it is soon overwhelmed by so many adverse influences.

The Wonders of Electricity.

Hon S. S. Cox, in the annual address delivered before the Indiana Asbury University, at Greencastle, on the 19th ult., said:

"The electric monograph transmits messages in the original handwriting. The hektograph multiplies your epistles; the telephone enables people to make contracts through an orifice; but as there is no witness, photography comes in and records the shadow of the sound by curves in vowels and consonants!

"Electricity is an elemeut elusive and subtle, yet it is stored in a box and imprisoned in a metal to be used at pleasure for portraiture, sound, light, or power. I have seen an organ in Berlin played by electricity, but this is simple compared with other experiments. Is it not a marvel that we can telegraph from a moving railroad car or the speeding steamship? A California photographer obtains six photographs in one leap of a clown in six different positions. He catches a horse on a gallop, a rabbit on a run, and a bird on the wing. By means of a wire a circular saw or a locomotive may be—nay, has been—run miles distant from its source of force. Electricity is horn of the sun. It may be converted back to its source, so that when one talks by telephone he may see his distant colloquist. It is shrewdly believed that nerve power depends for increased strength on light. It will not be strange if the polyscope illuminates the animal organism, rendering the body transparent. The vast current of liquid force which we call electricity is condensed in boxes like desiccated meats, or spread over continents to convey intelligence. Man can never overdraw from this vast, bankruptless depository of nature.

A NEW ART PROCESS.—An invention, relating to the production of photographs upon woven fabrics, has been patented by a London house. The patent has also for its object the preparing or treating of the woven fabrics in such a manner that they will be protected from the action of damp air, and from other atmospheric influences, and will be in a proper condition for receiving oil color on their surface. The process for treating the fabric for the purposes described is as follows: The fabric is stretched on a suitable frame and coated with wax or equivalent fatty substance on the front or picture surface until it appears entirely smooth and compact. After the coating of wax has become hard, the other or reverse side of the fabric is coated with varnish, the latter combining with the wax which has penetrated the fabric. By this process the fabric is effectually protected from atmospheric influences; it is rendered as dense, and non-absorbent as ordinary painters' canvas prepared for painting, and the clearness and depth of the photographic tone is increased to such a degree that the effect produced excels that of photographs on albumenized paper. The fabric may ultimately be painted with oil colors and varnished, and treated in the same manner as ordinary oil painting. The material is very useful for reproducing maps and plans of any dimension, and will be found by engineers to be of great value, both for these purposes and for working drawings, which may be repeatedly cleaned by soap and water, and bear the roughest treatment.

THE CARSON FOOTPRINTS.—Dr. Harkness, who is the father of the theory that the Carson footprints belong to prehistoric man, has discovered in another locality, some distance from the Carson State prison quarry, a series of similar footprints, which are even better defined than those in the Carson sandstone. They have the additional advantage of being covered by a stratum only about one foot thick, which is easily removed. A large area of the sandstone containing these impressions has been stripped. The impressions embrace the indisputed footprints of the wolf, deer and mammoth, as well as the tracks of the creature whose identity the scientists have not yet settled to each other's satisfaction. The Doctor still insists upon the correctness of his theory, for they do not, he says, present a suggestion of a claw mark, which he holds would certainly be the case had the footprints been made by a bear or by a giant sloth. In the footprints of the deer the toes are so well defined that one track can be readily determined as belonging to an old animal. The impression of the claws in the wolf tracks is perfect. The new district is to be thoroughly explored, and for that purpose Dr. Harkness has taken steps to get possession of the land.

MINERALOGICAL NOTES.—Damour describes, under the name of *Jereneiewite*, a new mineral found in southeastern Siberia. It occurs in hexagonal prisms, transparent and nearly colorless. H = 6.5; specific gravity, 3.28; fracture, vitreous; cleavage, absent. It is a borate of aluminium, with some ferric oxide and potassa. In appearance it resembles beryl, tourmaline or apatite. Dr. Doelter describes, under the name of *Dumrieherite*, a new hydrous double sulphate related to the alum gronp, found on the Cape de Verde islands, occurring in crevices of lava in the form of a superficial crust. It was apparently monoclinie, but had a fibrous structure. Soluble in water and astringent. Composition, a double sulphate of magnesium and aluminium, with thirty-six equivalents of water. Prof. H. C. Lewis lately described before the Academy of Natural Sciences of Philadelphia, crystals of serpentine which he had found in the dewelite of Way's quarry, Delaware. The crystals were of a smoky pearl color, with micacious cleavage. The identity of the crystals was established by physical and chemical characters.

HORSE POWER OF BOILERS.—While an estimate of horse power may be made on the basis of heating surface, the only way that the horse power of any boiler can be determined is by actual test of evaporative power. The old rule is that the boiler shall evaporate a cubic foot of water per hour for each horse power; but this evaporative capacity will answer for very coarse practice so far as the engine is concerned. Modern refinements in the steam engine have reduced the amount of water necessary to be evaporated to give a horse power. From fifteen to eighteen square feet of heating surface, and one square foot of grate surface, are required by the same rule for the stated amount of evaporation.

OUR ANIMAL ORIGIN.—It seems to me I can best lay this ghost of our animal origin by drawing attention to the fact that the swinging of any part that is sufficiently free may be used for steadying the body in walking. In man the arms are used, because most movable; but in lower animals the head is most often used. The domestic fowl moves the head back and forth alternately with the movement of the legs; the horse moves the head up and down; the cow moves the nose back and forth. Are these movements ghosts of a former real walking with the head?—*Joseph Le Conte, in Science.*

A NEW BEET-ROOT ACID.—In a paper printed in the Berichte der deutchen chemischen Gesellschaft, May 7, 1883, Edmund O. Lippssiarin, after alluding to the various acids obtained by him, by means of fractional crystallization, from the incrustations deposited by unripe or decomposed beet-roots in the evaporating-pans, (sugar works) states that he has now found a new acid, which he suspects to be oxycitric acid. The other acids found by him in the incrustations above alluded to, are citric, aconic, tricarbyllic, and malic acids.

To obviate these difficulties, it will be necessary to devise a method of insulating the wires so perfectly as to make them proof against the disturbing influences of induction. Thus far no insulation has been found sufficiently perfect to effect this object. But as the whole problem of the universal extension of the telephone depends upon this, it may be safely affirmed that its discovery will sooner or later be made.—*Manufacturer and Builder.*

RIGHT-HANDEDNESS.—It has been observed that "right-handedness" extends far down in the scale of creation. Parrots take hold of their food in their right foot by preference, and insects, like wasps, beetles and spiders, use the right anterior foot most frequently.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELIN'QNT.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Alta S M Co	Nevada	26	25	July 3	Aug 7	Aug 27	Wm. H. Watson	302 Montgomery st
Andes S M Co	Nevada	22	25	June 27	Aug 2	Aug 22	B Burris	309 Montgomery st
Argenta M Co	Nevada	16	25	June 21	July 24	Aug 17	E M Hall	327 Pine st
Albion Con M Co	Nevada	14	50	July 17	Aug 20	Sept 8	A W Havens	309 Montgomery st
Bodie Con M Co	California	3	50	Aug 4	Sept 10	Oct 10	G W Sessons	309 Montgomery st
Chollar M Co	Nevada	12	1.00	Aug 2	Sept 6	Sept 38	W E Dean	309 Montgomery st
Con Virginia M Co	Nevada	19	20	July 11	Aug 15	Sept 5	A W Havens	309 Montgomery st
California M Co	Nevada	8	20	June 26	Aug 4	Sept 3	C P Gordon	309 Montgomery st
Eureka Con M Co	Nevada	5	1.00	July 26	Aug 27	Sept 17	P Jacobus	309 Montgomery st
Excelsior D G M Co	California	22	40	June 16	July 23	Aug 10	T J Watson	114 Davis st
Excelsior D G M Co	California	1	5.00	June 5	July 9	July 26	W. Cunningham	326 Montgomery st
Grand Prize M Co	Nevada	14	25	June 25	July 27	Aug 20	E M Hall	327 Pine st
Gould & Curry M Co	Nevada	45	50	June 15	July 20	Aug 13	A K Durbrow	309 Montgomery st
Holmes M Co	Nevada	7	30	June 27	July 30	Aug 21	C T Bridge	419 California st
Justice M Co	Nevada	39	10	July 9	Aug 13	Sept 3	R E Kelly	309 Montgomery st
Mexican M Co	Nevada	23	50	July 17	Aug 22	Sept 11	C L McCoy	309 Montgomery st
Ophir M Co	Nevada	45	1.00	July 28	Aug 31	Sept 20	C L McCoy	309 Montgomery st
Savage M Co	Nevada	56	50	July 19	Aug 21	Sept 10	E B Holmes	309 Montgomery st
Sierra Nevada M Co	Nevada	7	77	Aug 9	Sept 12	Oct 2	E L Parker	309 Montgomery st
Union Con M Co	Nevada	23	50	July 17	Aug 20	Sept 11	J M Buffington	309 California st
Utah S M Co	California	10	1.00	July 20	Aug 27	Sept 14	G C Pratt	309 Montgomery st
Virginia Con M Co	California	10	01	July 24	Sept 3	Sept 24	A F Benard	364 Howard st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Alexander M Co	Nevada	2	1.00	June 20	Aug 6	Aug 27	J K Warren	307 Montgomery st
Bald Mountain M Co	California	2	3	June 26	July 27	Aug 30	L Shannahan	125 First st
Champion M Co	California	12	10	June 4	July 34	Aug 11	T Wetzel	522 Montgomery st
Como Eureka G and S M Co	Nevada	1	25	July 23	Aug 29	Sept 18	L Hermann	220 Sansome st
Eintracht G M Co	California	12	05	June 19	Aug 8	Aug 27	H Kunz	209 Sansome st
Excelsior Water and M Co	California	5	60	July 6	Aug 11	Sept 3	W J Stewart	215 Sansome st
Equitable M Co	Utah	28	25	July 24	Aug 31	Sept 23	C J Collins	512 Montgomery st
Genesee M Co	California	1	40	June 20	July 30	Aug 22	J Stedtfeld	419 California st
Golden Fleece Gravel M Co	California	3	50	Aug 1	Sept 5	Sept 22	F Schirmeier	785 Folsom st
Hazard Gravel M Co	California	7	11	June 20	Aug 16	Sept 4	J T McGeoghegan	318 Pine st
Howard-bound M Co	California	7	25	July 23	Aug 27	Sept 10	A S Bowie	314 Montgomery st
Homer M & M Co	California	3	10	Aug 2	Sept 8	Oct 2	F E Luty	330 Pine st
Linn Con M Co	Arizona	7	05	Aug 6	Sept 10	Oct 6	R D Hopkins	436 Montgomery st
Pacific M & Reducing Co	California	1	25	June 20	July 25	Aug 15	J W Bevilng	413 California st
Pittsburg M Co	California	16	10	July 24	Aug 28	Sept 15	E Wegener	414 California st
Roma Union M Co	Nevada	2	02	June 18	Aug 6	Aug 27	F. X. Singer	518 Sansome st
Swansea M Co	California	3	25	July 21	Sept 1	Sept 24	M A Wheeler	119 Market st
Seaton G M Co	California	3	8	July 31	Sept 5	Sept 27	A Martiu	525 California st
West Branch Feather River M Co	Cal	1	01	July 16	Aug 20	Sept 10	A B Paul	323 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Alta S M Co	Nevada	Wm H Watson	302 Montgomery st	Annual	Aug 16
Atlantic Con M Co	Nevada	D Wilder	328 Montgomery st	Annual	Aug 20
Champion M Co	California	B Burris	309 Montgomery st	Annual	July 30
Golden Fleece Gravel M Co	California	F Schirmeier	785 Folsom st	Annual	Aug 18
Independence M Co	Nevada	J W Pew	310 Pine st	Annual	Aug 20
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	Annual	Aug 16
Navajo M Co	Nevada	J W Pew	310 Pine st	Annual	Aug 14
Occidental M Co	Nevada	A W Durbrow	309 Montgomery st	Annual	Aug 13
New York Hill M Co	California	J B Leighton	327 Clay st	Annual	July 30
South Feather Water & U M Co	California	A J Halsey	328 Montgomery st	Annual	Aug 13

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Bulwer Con M Co	California	W Willis	309 Montgomery st	15	July 2
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	July 13
Navajo M Co	Nevada	J W Pew	310 Pine st	25	May 14
Silver King M Co	Arizona	J Nash	315 California st	25	July 12
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	June 12

Table of Highest and Lowest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING July 19.		WEEK ENDING July 26.		WEEK ENDING Aug. 1.		WEEK ENDING Aug. 9.	
Alpha	2.00	2.30	1.90	2.00	1.80	2.00	1.70	2.30
Atta	.65	.75	.60	.70	.65	.70	.70	1.10
Andes	.45	.40	.75	.35	.70	.65	.50	
Albion	.35	.40	.35		.35		.35	
Argenta	.05	.05	.50			.15	.25	
Atlas								
Belcher	1.20	1.25	.85	1.15	.80	1.00	1.00	1.20
Belding								
Best & Belcher	4.15	4.30	4.00	4.30	3.75	4.30	4.25	4.80
Bullion	.85	.75	.80	.70	.80	.90	1.28	
Bechtel								
Belle Isle	.35	.45		.35		.40		.40
Bodie Con	.60	.80		.65	.65	.70	.35	.45
Benton	.15	.20	.15	.20		.15	.20	.25
Bodie Tunnel		.30						
Caledonia	.25	.25		.25		.25		.25
California	.10	.15	.05	.15	.25	.40	.40	.50
Challenge				.30		.30	.30	.40
Chollar	3.35	3.80	3.50	3.85	2.90	3.30	3.00	3.25
Confidence	2.00	2.15	1.65	1.75	1.55	2.00	2.00	2.25
Con. Imperial				.10		.05		.10
Con. Virginia	.35	.55	.35	.40	.30	.40	.35	.50
Crown Point	1.30	1.45	.85	1.10	.80	1.10	1.00	1.25
Day		.50		.50	.35	.55		.60
Elko Con		.25				.25		
Eureka Con	4.50	5.00	4.75	5.00	4.80	6.00	5.50	6.00
Eureka Tunnel				.50	.50	.55		.40
Exchequer	.20	.50	.40	.50	.40	.50	.45	.60
Grand Prize		.05		.05				
Gould & Curry	2.90	3.05	2.80	3.05	2.55	3.15	3.00	3.70
Hale & Norcross	6⅝	6⅝	6.75	7.00	6.00	6.50	6.00	6.75
Holmes								
Independence		.50		.50	.45	.50		
Julia								
Justice					.10	.15	.20	.25
Jackson		.50						
Kentuck		2.60						
Martin White				.25	.20	.25		.30
Mono			2.80	2.95				
Mexican	2.60	2.95			2.80	3.25	3.35	4.10
Mt. Diablo	5.00	5.50		5.50	5.00	5.50		5.00
Mt. Potosi								
Noonday								
Northern Belle			6.75	7.90	6.75	7.25		6.75
North Noonday								
Navajo	2.85	3.10	3.05	3.40	3.10	3.25	3.10	3.25
North Belle Isle		.35		.40		.40		.40
Occidental		1.50		1.75	1.70	1.75		1.80
Ophir	2.30	2.55	2.40	2.70	2.40	3.00	3.35	4.20
Overman	.30	.35		.35	.30	.40	.35	.50
Oro								
Potosi	1.50	1.70	1.40	1.60	1.10	1.40	1.25	1.35
Final Con		2.10						
Savage	2.10	2.45	2.25	2.40	1.80	2.20	2.05	2.25
Seg. Belcher			2.0	3.00		3.00		3.00
Sierra Nevada	3.65	4.10	3.80	4.35	3.85	4.25	4.20	6⅛
Silver Hill								
Silver King	6⅛	6⅝				6.50		
Scorpion	.55	.65	.60	.65	.60	.90	.70	.85
Tuscarora								
Union Con	4.40	4.95	4 80	5⅛	4.70	5.00	4.95	6.50
Utah	2.40	2.75	2.30	2.50	2.20	2.20	2.50	3.35
Ward								
Wales								
Yellow Jacket	3.75	4 00	2.75	3.50	2.80	3.05	2.95	3.65

Bullion Shipments.

Mt. Diablo, July 30th, $11,647; Syndicate, Aug. 2, $7,957; Christy, 6th, $6,456; Contention, 2d, $9,-894; Mt. Diablo, 3d, $10,424; Northern Belle, 3d, $9,039; Tiptop, 6th, $10,000; Standard, 6th, $13,-666; Northern Belle, 6th, $5,272; Stormont, 1st, $3,130; Crescent, 1st, $5,690; Horn Silver, 1st, $12,-000; Ontario, 2d, $6,500; Crescent, 3d, $4,875; Horn Silver, 3d, $9,000; Ontario, 3d, $6,470; Hanauer, 4th, $8,200; Stormont, 4th, $2,820; Horn Silver, 4th, $9,000; Vienna, 4th, $9,000; Ontario, 4th, $4,353.

TUCSON, A. T., is lighted with gas.

Sales at San Francisco Stock Exchange

THURSDAY A. M., Aug. 9.

480	Alta	1@10	
250	Andes	80@85c	
50	Alpha	2	10
140	B. & Belcher	4	75
70	Belcher	1	10
60	Bullion	1	10
100	Benton Con	20	
145	Chollar	3.15@3.20	
350	California	45c	
1100	Caledonia	25@60c	
605	Con. Virginia	45@50c	
100	Crown Point	1	15
500	Con. Imperial	10	
490	Exchequer	60@65c	
320	Gould & Curry	3.55@3.60	
425	Hale & Nor	6⅝	
370	Mexican	3⅛@3.80	
60	Navajo	3.25	
95	Ophir	4.05@4 10	
50	Overman	45c	
445	Potosi	30c@1.35	
300	Savage	2.20	
1455	Sierra Nevada	5⅞	
1200	Senator	5c	
210	Scopion	70@75c	
25	Utah	3	
10	Union	5⅞	
330	Yellow Jacket	3.30	

AFTERNOON SESSION.

100	Alpha	2
200	Alta	1.05
300	Argenta	10c
90	Belcher	1.10
100	Belmont	1.05
375	Bodie Con	35@40c
100	Bullion	20
140	B. & Belcher	4.75
550	Chollar	3.15@3.20
1000	Con. Virginia	45c
500	California	45c
100	Con. Imperial	60c
850	Exchequer	60c
100	Eureka Con	5⅛
70	Gould & Curry	3.85
530	Hale & Nor	6
570	Mexican	3.85@3.90
70	Navajo	3.25
100	N. Belle Is	40c
805	Ophir	4.10@4.15
320	Potosi	1.35
390	Savage	2.15
1390	Sierra Nevada	6⅛@6⅜
100	Scorpion	80c
1000	Seuator	20c
250	Tiptop	30c
540	Union Con	6⅛@6⅜
265	Utah	3.30@3.35

Mining Share Market.

There has been more animation in the stock market this week than has been the case of late, yet no developments have taken place that have attracted attention. The movement in the north end stocks was largely due to the annexed press telegram from Virginia on the 7th. "A drift has been started north in ore on the 3000 level of the Union. When it reaches the Sierra Nevada line, that company will take the drift, and the Union folks will cut south in ore."

The following mining companies had a cash balance on hand August 1st: Alta, $3,073.05; Andes, $9,262.80; Alpha Con., $4,350.26; Bodie Con., $25,-643.34; Best & Belcher, $13,022.73; Bulwer, $4,275.-40; Benton Con., $10,036.36; Belcher, $25,824.48; Challenge Con., $5,405.78; Con Virginia, $8,211.26; Con. Imperial, $5,759.19; Chollar, $3,510.41; Crown Point, $23,542.13; Double Standard, $47.70; Day, $4,732.65; Gould & Curry, $35,512.37; Hale & Norcross, $26,326.53; Jackson, $3,367.60; Martin White, $41.58; Mono, $3,139.85; Northern Belle, $16,863,-70; Ophir, $2,017.87; Occidental, $5,945.71; Potosi, $8,108.44; Silver Hill, $2,181.90; Sierra Nevada, $15,608.45; Summit, $1,248.15; Standard, $157,899.-09; Tioga Con., $830.82. Belcher owes the Sutro Tunnel $10,920. Day has bills payable amounting to $91,151.81. Northern Belle has $191,951.93 in unsold bullion besides the above cash.

The following had an indebtedness August 1st: Albion (approximated) $260,000; Grand Prize, $11,-576.62; Lady Washington, $3,938.88; Mexican, to Nevada Bank, July 31, $13,156.06; Savage, $2,110.27.

THE Eureka *Sentinel* says: The French mining experts who visited Centerville, White Pine county, accompanied by ex-Senator Spencer, and examined some property there for a Paris syndicate, will, it is understood, make a favorable report.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

ALL DONE AT HOME.—*Dispatch*, Aug. 4: There is every reason to believe that the Pacific and Empire mines are yielding more bullion than ever before and that the facilities for working the auriferous, quartz are better; and that the water supply is so abundant that the mills can be kept running at full blast nearly the whole year round. All the work of extracting the gold from the rock both in the mill and also in chlorinizing the sulphurets will be done on the claims.

KELLY MILL.—*Ledger*, Aug. 4: We visited the Kelly mill the past week. It is running on rock from the Morgan claims. The ore is being taken from two points, one on Hunt's gulch side, the other on Murphy's gulch side. There is considerable difference in the character of rock from the two points. One is a dark-streaked, commonly known as ribbon-rock; the other is lighter, but carrying a large percentage of sulphurets. A cleanup is now being made, and we hope to give the result next week.

THE Lamping gravel claim near Irish hill is being worked by Chinamen on shares. The Kennedy mill is being fitted up for the purpose of crushing a quantity of rock from the St. Louis mine. There is no change in the situation at the Jackson. Baling out water is the only work prosecuted.

Calaveras.

NOTES.—*Chronicle*, August 4: Work at the New Conbination mine, owned by Emerson & Co., is progressing. The main shaft has reached a depth of 65 ft. Machinery is being put up for the purpose of keeping the water out.

El Dorado.

GREENWOOD.—Georgetown *Gazette*, July 28: The rich strike at the Morrell Con. proves to be of more importance than was anticipated. The vein of pay ore continues to improve in size and richness, and the prospects obtained from the decomposed quartz and vein matter are immense. Ricci & Hannay are at work on the Garibaldi. Mr. Ricci has some beautiful samples of gold obtained from this claim, and the prospects in the drift now being run are most flattering. The Union Hydraulic mine immediately adjoining is also a claim of great promise. We understand that parties are in treaty for the purchase of the Union.

Inyo.

KEYNOTE BULLION.—*Independent*, Aug. 4: During the past week the output of gold bullion from Beveridge district, according to the statement of the agents of Wells, Fargo & Co. at this place, amounts to 100 ounces each from the Lasky and McEvoy mills. Both were running on ore from the Keynote, and the result figures up $2,800 in gold. The cleanup at Lasky's mill was for one week's work, and at McEvoy's from six days' crushing.

MONTEZUMA.—Operations of the Owens River Mining and Smelting Co., at Elna, are being carried forward with vigor. Great progress will be made, and it is confidently expected that the furnace will be in readiness to begin operations in 30 days.

SWANSEA.—Most of the necessary material for the new furnace at Swansea has been received, and doubtless the works will be crowded right along.

Mono.

STANDARD CON.—Bodie *Free Press*, July 31. During the week ending July 28th there was extracted and shipped to the mills 1,287 tons of ore; received 2,391 ounces of crude bullion, and shipped to the company this day $14,004.07.

BULWER CON.—During the week ending July 28th the west crosscut from the north drift, 700 level, was driven 12 ft, and is now in 371 ft, in hard ground. South drift from west crosscut No. 1 has been driven 14 ft, and is in 179 ft, showing 1½ ft of vein.

BODIE CON.—*Free Press*, August 1: During the week ending 27th inst. 142.005 tons of ore were sent to the mill, and 146.475 tons were crushed. The average assay value of the pulp was $23.50 per ton; that of the tailings was $4.15 per ton. The shipment amounts to $2,261.88.

DEFIANCE.—Supt. Gorman of the Defiance mine, at Darwin, is making a very successful run of the furnaces on about 600 tons of good ore. This is the property in which Senator Reddy has sunk a fortune but expects to take out a larger. It is an immense smelting proposition, and the railroad will greatly deerease the cost of reducing the ore.

NOTES.—Homer *Index*, August 4: The Virginia Creek Hydraulic Co. is still washing in very rich ground. The Ohio mine on Mount Gibbs was on Friday bonded to W. A. Irwin for $25,000. D. E. Jones will in a few days begin operations on the Johnson mine, Jordan district. Paul Rouze has started up his arastra, in Lake canyon, on ore from the Rocky Point mine, above the May Lundy. The furnace of the Detroit Copper Co., Jordan district, is turning out about two tons and a half of copper per day. Bill Erwin made a cleanup at his arastra below Lake Lundy last Saturday, the result being $42.50 to the ton. Bill worked the arastra as an experiment, and this week began taking out ore from the Clifton mine for an extended run. The Gorilla mine is turning out a large quantity of good ore, and it is the intention of the management to keep the Lundy reduction works running day and night all winter. The May Lundy still has a large supply of ore on hand, at the mill, at the foot of the tramway and in the chutes.

Nevada.

GOLD TUNNEL.—*Transcript*, August 2: It is the talk of the street that arrangements are being made to resume operations on the well-known Gold Tunnel ledge from which in years gone by the California and the Gold Tunnel Companies realized large sums of money, although imperfectly worked. Gold Tunnel was the first quartz mine discovered in the county, the ledge being struck in 1850. A mill was erected in 1851, and although nothing but specimen gold was saved, the results were profitable. Up to 1855 it had yielded over $300,000, none of the sulphurets being saved. It has changed hands two or three times, but has not been systematically worked. Geo. G. Allen obtained a patent for that location and others, including the once famous California, making in all 5,000 ft on the ledge.

LOCKLIN'S.—The 20-ft overshot wheel recently set up at Locklin's mine, on Deer creek, runs the hoisting and pumping machinery in admirable style. The ineline is being put down rapidly, as the developments are highly satisfaetory. The water is taken out of Deer creek 3,000 ft above the mine.

LITTLE YORK.—The mines in Little York township have nearly all closed down for the season, owing to the scarcity of water. At Red Dog, the English Co. have continued the old Greenhorn tunnel into the hill further, so they are now able to continue washing on the Blue Lead. Having built a new reservoir up on the hill they are enabled to turn on a "double header." This claim is run day and night and employes from 12 to 16 men. This is the only claim running in this once prosperous burg. But few houses are left as relics. The English Co., at You Bet, are opening up a drift claim at Wilcox ravine, on the Uncle Sam ground. The report is that they have struck gravel that will justify the erection of a crushing mill. Should underground mining pay at You Bet the town will revive, for there is an immense amount of drift ground here, also lots of hydraulic ground that will pay when water gets cheaper.

THE DEAD RIVER CHANNEL.—*Transcript*, Aug. 2: Jas. Heath, of Pet Hill, and M. Simons and C. P. Crittenden, of San Jose, are in the vicinity of Big tunnel, Washington township, determining a point at which to start a tunnel to tap the vast lead of auriferous gravel that is believed to underlie the ridge separating Deer creek and Steep Hollow. The intention is to penetrate the ridge from the Deer creek side. Messrs. Crittenden and Simons represent two companies organized at San Jose for the purpose of ascertaining the value and extent of the Dead river channel in that region.

LONE TREE.—Grass Valley *Tidings*, July 27: Shortly the Con. Lone Tree will resume work. The property is at Forest Springs and is a location of 3,000 ft, embracing three separate ledges, one of them being 2½ ft thick, and the others averaging eight inches. There is a tunnel on the property 700 ft in length, which cuts all three ledges. Pan washings yielded from $2.50 to $15 to the pan, and much of the gold was in large lumps.

PROVIDENCE.—*Transcript*, Aug. 8: Since the 40-stamp mill of the Providence mine was completed two years ago, crushing has been going on night and day, holidays and Sundays, not one of the stamps having been "hung up" at any time. About 95 tons of ore is milled every 24 hours, and 800 or 900 tons ore is always kept in the ore bin. Enough ore is uncovered in the mine so that the mill could be kept running constantly for 10 years without further sinking or drifting.

Plumas.

MILLS SHAFT.—Quincy *National*, July 28: The tube in the Mills shaft is down 200 ft, and there are indications that it is nearly to bedrock. For several days the drills have been at work on large quartz bowlders. On Saturday it came to a stop, probably on a large bowlder, and a square timber 20 ft long and weighing two tons was hung up by the cable and used as a battering-ram, striking on timbers across the top of the tube. This forces it down slowly. There are good reasons to expect a prospect when bedrock is reached. Pan prospects show fine gold. Mr. Mills seems confident of good results. Should he prove successful, the shaft will lead to operations of a magnitude unsurpassed on the Pacific coast.

EMERALD DISTRICT.—Greenville *Bulletin*, Aug. 1: Major Whitlock has a force of men at work developing the silver ledge in Emerald district. Mr. Whitlock stated that he would continue the work till the vein should be fairly tested. Later developments at the Lucky S. mine are encouraging. In the bottom of the shaft the ore is richer than any previously found. Several of the best informed operators in the county have bought a good deal of the stock, all of which is owned by residents of this neighborhood.

RICH PROSPECTS.—During the past week some rich prospects have been found near town, on the slopes of Green mountain. On the Crown Point ground Will Blood found a prospect that is immensely rich. John Richards brought in a prospect in which the gold is very thickly distributed all through it.

RIVERDALE.—Quincy *National*, July 28: Work was commenced on Monday at the Riverdale mine. The Riverdale is what has been known as the O'Neill ranch mine, and an attempt to open it was made some three years ago by Meylert & Hughes. A shaft was sunk to bedrock, about one hundred ft in depth, and a short drift run from it, from which excellent prospects were obtained. The machinery was too light to handle the water. The Co. now at work have means to open and develop it in good shape. Their machinery, bought in Virginia city, is capable of handling four times the water which will be encountered. The new shaft is located sixty or eighty ft east of the Hughes & Meylert shaft. It will be five ft by ten, in the clear.

San Bernardino.

BURROUGH'S DISTRICT.—*Index*, July 28: For several weeks W. G. Scofield, Supt. of the Ralston Co. of San Francisco, has been inspecting the mineral outlook of San Bernardino. On the Mohave river, four miles north of the Forks, and near John Burcham's ranch, he has organized a new mining district, having discovered ore that promises great richness. Assays gave $475 as the lowest, and $2,561 in gold as the highest, from merely surface rock. Four locations have been made. Mr. Scofield has also sent to San Francisco for analysis, specimens which have a large percentage of platinum.

GARFIELD.—Calico *Print*, July 28: There are 15 men in the Garfield mine. The work is progressing smoothly and with rich results. About 70 tons of first-class ore have been hauled to the Alhambra mill. There are 10 tons on the dump. Work is progressing in the lower tunnel, which is in 70 ft. The main shaft has been sunk 70 ft further to connect with tunnel.

PLUTARCH.—The lessees are chloriding on the east end of the claim, and are taking out good ore. Work has been suspended in the shaft which is down 40 ft. There are about 20 sacks of first class ore on this dump.

ALHAMBRA.—A couple of men are prospecting, and have opened another body of ore. The ore is hauled to the Alhambra mill.

GOBBLER.—Over a dozen men are working in the Gobbler, and are taking out fine ore. This mine is

improving in appearance and is no doubt working in an extension of the rich body of ore that is making the Garfield mine so famous.

GOLCONDA.—The claim is being carefully prospected and ore has been found in a half dozen places. In the center of the claim a shaft has been sunk 15 ft, from which good ore has been taken. About 75 tons of low grade ore that will average $60 to the ton are on the dump. They have 10 tons of fine ore which will be shipped to San Francisco shortly.

BLACKFOOT.—Calico *Print*, August 4: About 30 tons were taken out lately from this mine, which is reported to go $4,000 to the ton. How long this rich sort of affairs will stay with the Blackfoot, we know not.

ORIENTAL.—The Oriental with steam hoisting works and some 25 men are drifting on the 300 level.

MAMMOTH.—The Mammoth is still at work. They use a force of 26 men, and send on an average 15 tons of ore to the mill.

SILVER KING.—No stoppage in the work at this mine and 55 men are rolling out ore daily. They have commenced to work in the old Cunningham tunnel on the fifth level. The last average of ore per ton was $120. battery sample. For the month of July $50,000 go into the pockets of the owners.

ORO GRANDE.—*Times*, July 27: Fourteen bars of fine bullion weighing 1,380 pounds and worth $25,028.40, were received at the express office from the Oro Grande mill this morning. This is the result of 11 days' run on King ore, and makes an even 100 bars so far turned out. The one hundredth bar was carefully packed up and will be sent by Colonel Markham to Milwaukee, where the majority of the company reside.

Shasta.

BELLY CHOOP.—Cor. Redding *Independent*, Aug. 3: Work on the mines is going on as usual. The Mammoth people have run through a five-ft ledge, and are pushing the tunnel. The Cumberland are taking out rich sulphurets. Lockhart and Inghani have made a strike on the east side. The name is the Uncle Sam. Besides free gold, it carries copper sulphurets. Some of our old prospectors have left here for Deadwood.

NOTES.—*Courier*, Aug. 4: Carmer and Arnold were in town from Flat creek mining district a few days ago; where they report mining prospects splendid. Ed. Durfor has a quartz specimen worth $12 or $15 which came from the mines at the mouth of Rock creek. Jones and Son are preparing to erect an arastra on Middle creek to crush quartz from their ledge near the Lower springs. For about 8 months in the year Middle creek furnishes ample water to run a hundred arastras.

Sierra.

NOTES.—Downieville *Messenger*, July 28 Jas. Murrow & Co. are sinking in the river below Shady Flat. The early low water is favorable. The Home Stake mill is not running at present, but workmen are running a tunnel to find a gravel channel. Last week's cleanup of the B. M. N. Co. was the largest the company has ever had. From a little less than 700 carloads, 1861½ ounces of gold was obtained. Taylor & Forbes have a contract for supplying the Four Hills mine with shoes and dies. A. Moran is packing them. At the Rainbow mill, last week, for a run of five hours, $5,000 was taken from the plates alone, the battery not being cleaned up.

PRIMROSE.—Downieville *Messenger*, Aug. 4: P. A. Lamping, Supt. of the Primrose quartz mine, last Saturday stated that the mill has crushed all the rock taken out by the Uncas Mining Co., which paid satisfactorily. The present company does not intend to take out any rock where the Uncas Co. found theirs, but will re-open the shaft of the old Primrose, and extend the lower tunnel to the pay chimney.

THE Bald Mountain Co. shipped $5,000 worth of bullion to the mint last week.

THE Bald Mountain Extension Co, continue to find big pay in the South Fork ground.

Trinity.

EAST FORK QUARTZ.—From Chris. Meckel, we learn that Day, Moore & Hubbard are progressing finely with the work of building a dam, flume and arastra, and that they will have everything in readiness for crushing rock before long. Their ledge is one of the richest ever found in the county. John W. Shuford was in town from Trinity Center this week and tells us that prospecting for quartz is being done in that section with fair promise of success. Mining is as nearly at a standstill in this county at the present time as it ever gets to be. There is no water at all for hydraulic mining purposes, nor yet enough for grinding quartz in arastras. About all the mining that is being done is along Trinity river, the season being particularly favorable for wing damming. Placer miners will soon begin the work of fitting up their claims for next season's run.

Tuolumne.

GREEN MINE.—Sonora *Democrat*, Aug. 4: The lead in the Green mine pinched out or was lost awhile, but last week by changing direction of work it came in again and is yielding very rich ore, with every indication of a large body of high grade rock. Tuesday Wm. A. Clark, one of the owners, brought down the result of the last run in the mill, amounting to over $3,000.

NEVADA.

Washoe District.

HALE AND NORCROSS.—*Enterprise*, Aug. 4: The connection between the upraise from the 2,600 and the winze down from the 2,400 level has been enlarged to the full size of the winze, and has been timbered up. The ore in the bottom improves in quantity and quality.

UNION CON.—The joint Sierra Nevada west cross drift on the 3,000 level is in vein material of a promising character. In case of the ground becoming less favorable, the drift will be discontinued, and north and south drifts started in the ore already passed through.

SIERRA NEVADA.—The Union Con. west cross drift on the 3,000 level is continued, as the material is favorable. The drift will be pushed so long as it promises well.

ALTA.—Drain boxes are being placed in the drift leading out to the Sutro tunnel on the 1,030 level, and a pump tank is being constructed in the shaft at the same level.

YELLOW JACKET. Some 40 or 50 tons of ore are still being extracted, but owing to the low stage of water in the Carson river, the mills will be obliged to shut down.

CON. VIRGINIA. Have placed the pump tank and donkey pump in position in the joint C. and C. winze at the 2,800 level and resumed sinking. The drift on the 2,700 level is being advanced 10 ft per week.

MEXICAN.—The upraise from the 2,900 level is being advanced as rapidly as the nature of the rock will permit. The main north drift on the 3,100 level is advanced at the rate of 30 ft per week.

UTAH.—The pump-bob station is repaired. Are now ready to resume work in the west crossent on the 1,350 level.

OPHIR.—Repairs to the Central tunnel are completed, and are now opening out and retimbering the drift leading to the old Mexican shaft.

BEST AND BELCHER.—Work in the drifts, which was suspended to allow the water to drain off, has been resumed.

CROWN POINT.—Owing to the low stage of water in the Carson river, there is no ore being extracted.

GOULD AND CURRY.—Work was suspended for a few days to allow the water to drain out, but has now been resumed.

CALIFORNIA.—Have placed the tank and donkey pump in position at the 2,800 level of the joint C. and C. winze, and resumed sinking.

SAVAGE.—Will begin crosscutting on the 2,600 level.

BELCHER.—But little doing owing to the low stage of water in the Carson river.

SCORPION.—The usual progress making in the west drift on the 500 level.

COLLAR.—No further prospecting will be done on the 2600 level until the new hydraulic pump is in operation.

ANDES.—Some quartz giving good assays has been cut in the west crossent.

UNION SHAFT.—Are still repairing the drain tunnel on the 1600 level, and repairing the 23 station.

Belmont District.

SAN ANTONIA.—*Courier*, July 28: The Arlington Leaching works at San Antonio are still running successfully. George Nicholl informs us that the Co. will ship another bar of bullion shortly. Nicholl & Co. have several tons of materials on the way, which will be used in the Ellsworth mill. It is expected that work will be commenced in earnest next week. Work is prosecuted in the Silver Point mines with flattering results. The ore is shipped to the Jefferson mill. The Belmont mine continues to look splendid. The Jefferson shipped a considerable amount of gold and silver bullion during the past week. Chas. Kanrohat, at Jefferson, is encountering rich ore.

Paradise District.

WILD GOOSE.—*Silver State*, July 31: The district has been under a cloud since the Paradise Valley suspended. This spring it occurred to J. V. McCurdy, of twenty year's experience on the Comstock, that arrangements could be made for the resumption of work. He knew by experience at the Bullion mill that the Paradise Valley and Wild Goose ores could be worked by wet process without roasting. He went to work with a will, and succeeded in getting the Paradise Valley to purchase the Wild Goose. He then repaired the Paradise mill, at a cost of several thousand dollars, and expects to start it within a week. We learn from Alex. Wise, who has a contract to haul ore to the mill, that he is now delivering 15 tons of ore daily, and will have 200 tons at the mill when it starts. He says there are 17 men at work at the Wild Goose, 12 of whom are mining. In the lower level, 100 ft from the surface, the vein is 12 ft wide, will average $65 to the ton. In a few weeks the mill will be producing bullion, and some 40 or 50 men will be employed.

Ploche District.

KINGFISHER.—*Record*, July 28: The men working at the Kingfisher mine sent to town during the week a lot of very good looking ore from the ledge recently struck. About 10 pounds was pounded up and assayed, the result being $132.98 in silver.

NOTES.—The prospectors at the new find 12 miles west of Coyote springs have run a tunnel 50 ft in length. A. C. House brought in six samples from there on Wednesday which assayed from $20 to $54. It is rumored in Bullionville that McMahon will start up work on his mining property in Pennsylvania district.

Reveille District.

RICH ORE.—Eureka *Sentinel*, Aug. 5: We received from Reveille, Nye county, yesterday, a singular looking piece of ore, very rich, but so different from ores here that miners would hardly take it to be ore at all. It is nevertheless quartz, carrying some galena, and a large proportion of silver. It is stained with iron and might be taken at a glance for a conglomerate of earth and brick dust. It is the same character of ore, only much richer, that was shipped into the Eureka Con. reduction works some time ago and fooled a number of our local mining experts. Along with the specimen the report of W. R. Norris, assayer, was sent us, and he vouches that it assays $11,386.10 A silver button accompanied the specimen, which was obtained from a half ounce of pulp.

Washington District.

ROMA MINE.—Reno *Gazette*, August 4: Ben. Batolgo, a prospector from Washington district, Lander county, came in town yesterday with what ore he could haul with one horse from the Roma mine. The rock assays from $85 to $800 per ton. His returns from five assays made were $85, $145, $300 and $800. He says he and his partners have run a tunnel in 60 ft, and tapped the ledge, which is 3 ft 5 inches wide.

White Pine District.

OSCEOLA.—Reno *Gazette*, August 4: John Armstrong passed through Reno yesterday and gave a history of Osceola. It is in White Pine county, 140 miles from Eureka and 22 from the Utah line. The mines are gold, both quartz and placer. The latter are idle for want of water, but a ditch 16 miles long will soon be built to bring 3,000 inches from the Snake mountains. The gold is coarse. The gravel is from 5 to 180 ft deep, and goes from 3½ to 25 cents a pan. There are nearly a thousand quartz claims located. The Credit Mobilier has just been sold for $85,000 to Mix & Co., of Aurora, Ills. There are two ledges, and they have gone down 220 ft, and found from 4 to 8 ft of ore, going $31 to the ton. The Fort Wayne claim was sold with it. At a depth of 150 ft the ledge is 12 ft wide, and the level is 150 ft in ore. The Crescent is 208 ft in ore. The Golden Eagle is 150 ft deep. A level 100 ft down is 200 ft in ore. The Cumberland is 120 ft deep, with a drift 32 ft. The Verdi is down 75 ft in the richest gold ore. The Red Monster is 75 ft down—ore worth $34. The Gilded Age is 54 ft deep in $22 ore. The Osceola is 80 ft down, with a drift 75 ft in ore that works $28 at the mill. Gilmer and Spencer built a five-stamp mill a year ago, and Mix & Co. are now putting up one with 10 stamps. Wood is plenty and water sufficient. The camp was discovered in 1874, but it was so far away that it received little attention. No one would believe that there was gold in southeastern Nevada. A hard winter came in 1881, however, and the boys washed $4,500 in gold, and that opened people's eyes, for no one in the camp could raise money enough to salt a claim like that.

ARIZONA.

NOTES.—*Final Drill*, July 28. They are pushing work on the Eureka and Surpriser. Work will soon be resumed on the Rosalie and the Australia. In the Surpriser they are working ten men. The prospect continues encouraging. In the Nacocha, the main shaft has been timbered and the sinking is going on; they are 65 ft down in galena. They employ three men. No wall yet. The ledge is very large.

ROGERS DISTRICT.—Another big strike is reported in the Snap mine. Donahue and Hutchinson have about completed their arrangements to attach steam power to their blower. The Windsor mill and Silver King mill are working as usual. Immense improvements are going on in the Silver King. Arrangements for ventilation are under progress.

BLACK HILLS.—Prescott *Courier*, Aug 3: The new smelter of the United Verde Copper Co. of Black Hills district, 15 miles to the north-east of Prescott, was for the first time charged at 12 o'clock Wednesday. It worked like a charm, and in twelve hours ran out upwards of six tons of copper. The ore carries its own flux. The hundred men in the district felt good over the result. Wm. M. Buffum brought the news to Prescott. He says there is enough ore in sight to keep one furnace running for two years. He says the yield per day will be from 8 to 10 tons of copper, that is, with one furnace.

THAT QUIJOTOA STRIKE.—Tombstone *Epitaph*, July 25th: An *Epitaph* representative met yesterday a gentleman who had made a visit to the new strike in the Quijotoa mountains, in the Papago country. His opinion is not favorable. The ledges are two, running parallel and about two feet in width, on a narrow backbone, and although some very rich ore has been secured—horn silver—no rich float and very little mineral is found at the bottom of the hill. Perhaps the vein can be traced for 8,000 ft, but only on the north end is good rock found, and even where the first locations were made there is nothing to indicate permanency.

TWENTY-EIGHT THOUSAND DOLLAR ORE.—Prescott *Miner*, July 27: Fifty-three pounds of horn silver were to-day shipped to Commissioner Murphy at Denver, by his brother. The ore was from the Pine Spring mine, Turkey creek, owned by Billy Galvin and others, and assays from $20,000 to $28,000 per ton, at which rate it was purchased from the owners of the mine—$595 being paid for the 53 pounds. The mine shows no indication of diminishing in richness. A 32-ft shaft has been sunk in such ore.

COLORADO.

NOTES.—Georgetown *Miner*, July 28: A shipment from the little Emma, on Democrat mountain, ran: first-class, 1,200 ounces silver, 23 per cent. lead; 2d class, 350 ounces. The two classes together averaged 520 ounces. On the Blue Grass, Columbia mountain, Scott Pagan and partner, last week, ran the drift ahead twelve feet. It is now in over seventy feet. The breast shows two ft of fine quartz. Eighteen tons of ore were shipped from the Fred Rogers last week. Eight sacks shipped by Robert Ray milled at the rate of 584 ounces per ton, and netted him $159. Mr. McArthur picked enough off the dump in two and one-half hours to bring him $9.00

MULTUM IN PARVO.—This lode is situated about 1,000 ft above the Live Yankee and a quarter of a mile from the Joe Reynolds, on Silver creek. There are six inches of ore in the bottom of a sixty foot shaft, and all the way down. This shaft was sunk from the bottom of the drift where the ore was first encountered. The last mill-run gave 686 ounces silver. The ore now being sorted, mill-runs from 200 to 300 ounces, and assays 1,000 ounces.

CARBONATE.—The snow is about all gone at Carbonate. The Ryan shaft is still full of water. Some large iron croppings have been found since the snow melted, which look well on surface. There are between 250 and 300 men over there, and they seem much encouraged by these croppings. The country is all staked for miles.

WEST ARGENTINE.—Supt. Vost has eight lessees on the Baker lode, Kelso mountain, and several more picking over the dump. In some parts of the leased premises, twelve inches of solid galena ore, running from 300 to 500 ounces, is encountered. The Richmond lode, McClellan mountain, is now leased from Senator Turck, by Messrs. Linn and Custer, of Silver Plume. They are sinking on a good pay streak and are said to be taking out a ton of ore a week, which runs from 200 to 350 ounces.

IDAHO.

TRAIL CREEK.—Ketchum *Keystone*, July 28: Samuel Huston came down from the Sallie lode, on Trail creek, yesterday, with about 50 pounds of copper silver glance ore. He has discovered a two and a half-ft vein of this, including a slight mixture of white quartz, and thinks he has the greatest mine in the country. Assays made of two samples went 900 ounces and 1,043 ounces in silver respectively, and a high per cent in copper. Messrs. Reynolds, Steward and Williams have a location of the same character, near by and feel equally jubilant.

ELKHORN.—Six ft of galena has been developed in the Elkhorn mine in tunnel No. 1. The miners have been driving ahead in the body for several days, and Judge Lewis informs us that it shows no signs of lessening. This is the largest body of clean, solid galena that has ever been encountered in the Elkhorn up to date. The vein averages three ft. while the largest place is in tunnel No. 3, where nine ft of galena and carbonates mixed was run through.

MONTANA.

ALICE.—*Inter Mountain*, July 28: About 90 tons of ore per day are put through the stamps. Ore is now being taken from the 200 and 300 levels, and a winze is being sunk to facilitate the development of a three-ft vein of 75 ounce rock. The bullion output for this month will be such as to make the stockholders feel very comfortable.

MAGNA CHARTA.—The immense surface strike has been prospected to a considerable extent, and each stroke adds evidence to the vastness of this remarkable chimney of ore. The vein has been found on the 100 and 200 levels.

LEXINGTON.—A 10-stamp salt battery has recently been added to the mill and is working in good shape. The bullion output for the present month is expected to be large.

POSER.—The vein is an immense affair, attaining at some points the width of 18 ft, and assaying from 30 to 100 ounces. At a depth of 80 ft a level has been started west and is now in 70 ft. There are 300 tons of ore on the dump.

NOTES.—The new steam hoist has recently been put up on the Goldsmith No. 2. At a depth of 80 ft, levels are being started east and west. Active operations are to commence on the Josephine soon. In the Moody and Sankey a very rich streak of ore has been struck.

WICKES.—While east Mr. Hauser succeeded in organizing a new company with a capital stock of $3,000,000, which bought out the Alta Montana works and mines, and has ordered the immediate erection of large concentrators and additional furnaces at Wickes.

ANACONDA.—*Inter Mountain*, July 27: The work of excavating for the new smelter began on the 23d. Twenty-five men and eleven teams with plows and scrapers are turning up the ground at a lively rate. One wing of the building is to be 260x150 ft, with 7 floors, and it is to extend into the hill so that all the material can be delivered from railroad cars from the upper floor and pass down in successive processes till it reaches the bottom floor. The furnace room adjoining is to be 350x280 ft. The water is taken from Warm Springs creek. The water is to enter a penstock shaft 70 ft deep to a turbine wheel, which will force the machinery of all the concentrating works.

NEW MEXICO.

BLACK RANGE. Kingston *Tribune*, July 26: J. M. Smith took a small quantity of the Dreadnaught ore and after crushing it had an assay made which showed a value in silver of 23 ounces. He then took a pan and washed the mass down to one-fifth its original size and took another assay which gave 117 ounces of silver. This is a pretty fair demonstration that the Dreadnaught will concentrate with profit. The owners of the Black Hawk up Chloride creek, in shooting out some fresh mineral for the Cincinnati exposition exhibit, brought to light a considerable quantity of native silver. The tunnel of the Pelican mine on the Palomas has been timbered, and four men are hauling out the ore. The tunnel, which is 80 ft long, together with its side drift one way of 14 ft and the other way 30, shows nothing but ore, roof, sides and floor. A fine display of mineral is accumulated to be sent to the Cincinnati exposition. The Dreadnaught sends a 100 pound chunk, which is the monster of the collection. One hundred and seventy two sacks of the richest looking mineral yet mined in the Apache district has been taken from the Silver Monument mine since the last shipment. The first shipment milled $140 in silver; the last gave $240, and the ore on the dump now ready for shipment is expected to yield $500 per ton. The shaft is now 150 ft deep.

SOCORRO. Las Vegas *Gazette*, July 25: The Little Jimmy is being developed as fast as five men can do it. Next is the Bullion. This mine has 400 ft of drifts and one large chamber of mineral which has yielded 500 tons of ore. They are shipping the best ore to the Denver smelters, and are keeping the second grade rock until Kingston shall have reduction works of its own. The ore assays $250 per ton, some of it running over $1,000. Next is the Superior. There are 500 tons of ore on the dump that will average $200 per ton. They are down 230 ft, and are working a pocket of black and green carbonates which they ship without sorting to Denver. Mr. Taylor, the superintendent, states that they are now working in a 20 ft level, which shows high grade ore for 106 ft, and a crossent of 28 ft has not yet found a sidewall. Leaving the Superior, three miles brings us to the Miner's Dream, which has been prospected but little. Within 300 ft of this is shaft No. 1, of the Iron King, which is also a very rich carbonate claim; 200 ft further on is shaft No. 2, which has reached a vast vein of galena, which will enable them to furnish lead enough to flux the hard ores found in the Bullion and Superior, and the lack of which was the great drawback to this camp. The Iron King has 1,000 tons of ore on the dumps, about 80 running 80 ounces of silver per ton. The Soltaire, on the North Perche, is at present idle. They are down about 50 ft, and have some very rich ore in sight. Uncle John Hancock has been sinking a shaft on the Van Wert, and has finally reached good second class ore.

OREGON.

NOTES.—Jacksonville *Times*, Aug. 3: Patterson Bros. have leased their hydraulic mines on Beaver creek. These claims are improving right along. Cleaning-up was finished at the Sterling mine a few days since, with good results. R. W. Dickerson and Mr. Ward, who have been running the quartz mill at Horsehead, Josephine county, informs us that water has failed entirely, causing a suspension of work. A cleanup has been made which, although not a large one, demonstrates that there is some good rock. The Messrs. Caldwell, who have been mining in Steamboat section for some time past, have struck excellent prospects. Their ground is rich and there is plenty of it.

Legitimate Mining.

Prof. J. E. Clayton writes: "I believe in legitimate mining, and think that men should engage in it just as they would in farming or manufacturing, or any other branch of national industry. The first step is to secure good mining property, the next to erect reduction works and commence the manufacture of bullion. Then if the business prospers and dividends can be paid out of the legitimate profits at regularly stated periods, it becomes proper and legitimate to place the property on the exchange lists. I think to do so before the mines are proved to be as valuable as represented, is an attempt (too often successful) to swindle the public."

Montana has been fortunately free from the pestiferous operations of the mining stock sharp. The development of our mining properties so far, has been the result of the legitimate working of the mines for their output of bullion. It was feared that the repeal by the last legislature of the non-assessable stock law, would result in an influx to the Territory of paper mine promoters, who would injure the standing of Montana properties by flooding the Eastern markets with worthless stocks; but happily no such result has yet accrued, and with one or two exceptions no attempt has yet been made to foist upon a confiding public, stock certificates representing property, the value of which only exists in the representations of the promoters. That schemes of this kind can be successfully operated, is a revelation of the credulity of the men who can be thus imposed upon. The more carefully considered investments now being made in mines and promising prospects instead of gauzy stock certificates, must soon change largely the profits of the business of stock mining and add a strong element of strength and stability to the actual development of mining properties.

No field of industry presents more substantial inducements for wise investment of money and labor than the limitless resources of our mineral-bearing Territories. Yet it is a fact that no legitimate and actually valuable line of business has been so basely prostituted by a class of conscienceless sharks, who have deliberately planned to deceive and defraud innocent people. The amount of utterly worthless stock, upon unknown and unknowable mines which never had and never will have a name or existence except in the debased imagination, and on the certificates of the soulless swindler, is marvelous and surprising.

Millions of hard earned dollars have been paid for stocks which are based upon no tangible evidence of value and were issued for the sole purpose of defrauding innocent people. Claims have been secured for the bare cost of location, and so-called mines which were purchased for $50, have been made the basis of a stock issue of tens of thousands of shares and a capitalization of millions. These millions of dollars, thus secured, are not only lost to the legitimate development of our mineral resources which are valuable, but the industry of mining and its immense interests in every State and Territory are retarded, and the capital invested in the prosecution of important mining enterprises has been made to suffer loss from the reproach and suspicion which have been engendered by so many disreputable schemes operated in the fair names of a most valuable and satisfactory business.—*Butte Miner.*

Secondary Bonanzas.

A year ago the knowing ones expected the Horn Silver would have petered out ere this. It was said that the mine pinched on the 300 and 400 levels; that the ore came in 56 feet thick on the 500, but only two feet of it was rich enough to pay, and that production would about cease with the (last) year. The stock weakened to $4. But in sinking from the 500 to the 600 the ore got better, although not so rich in silver as the surface bonanza. A winze has been dropped to the 700, and, as far as can be determined by a winze, the ore grows steadily better to that point. One can get any kind of an assay he wants. The shaft has been sunk and connection is about to be made on the 700 level with the ore body. The manager is no longer so careful to keep people out and to keep his men still as he was.

The stock has recovered to $7 or $8, and there are good judges of mines who regard it as a good purchase at that figure. And truly, a solid vein of clean ore, 50 to 60 feet thick and 300 to 500 feet long, followed 700 feet downward, is no slight indication of many dividends to come. The steady output of 100 to 150 tons a day, and the new lease of life given the mine by the opening of this second bonanza, are very satisfactory, to say the least. If bullion and dividends are what talk, then it must be admitted the Horn Silver has the floor. Also, that the generally unexpected permanence of the mine justifies the long and expensive preparations made by Major Hill, including the building of a new smelter near Salt Lake, before he really put the mine to producing.

I think it encouraging for Utah mines, generally, which it has been too much the fashion to abandon with the exhaustion of their surface bonanzas. There was a time when the Ontario ore yielded but $67 a ton for a year, and a quarter interest was offered at $375,000. After examination the offer was declined, yet since then that quarter has earned and paid $1,230,000 in dividends. The Eureka Hill, now producing more generously than ever before, is in what may be called its second bonanza. So is the Joah Lawrence, Crescent (Pinyon), the Cave; so will, I dare say, be the Emma, the Hidden Treasure, the Crismon Mammoth, Queen of the Hills, and a half score of mines at Bingham and elsewhere. It requires capital, and skill, and nerve and economy, and then the result is almost sure to be favorable.—*Cor. Salt Lake Tribune.*

The Harcuvar Mines.

These mines are situated in the northeastern corner of Yuma county, Arizona, in the eastern foothills of a range of the same name. They are owned, and being developed, by Messrs. D. C. Kling & Co., lately of Leadville, Colorado; these gentlemen having up to the present writing expended upwards of $20,000 in actual work on the premises. They are distant from the city of Phœnix 90 miles by wagon road, and are about 75 miles north of the line of the Southern Pacific railroad.

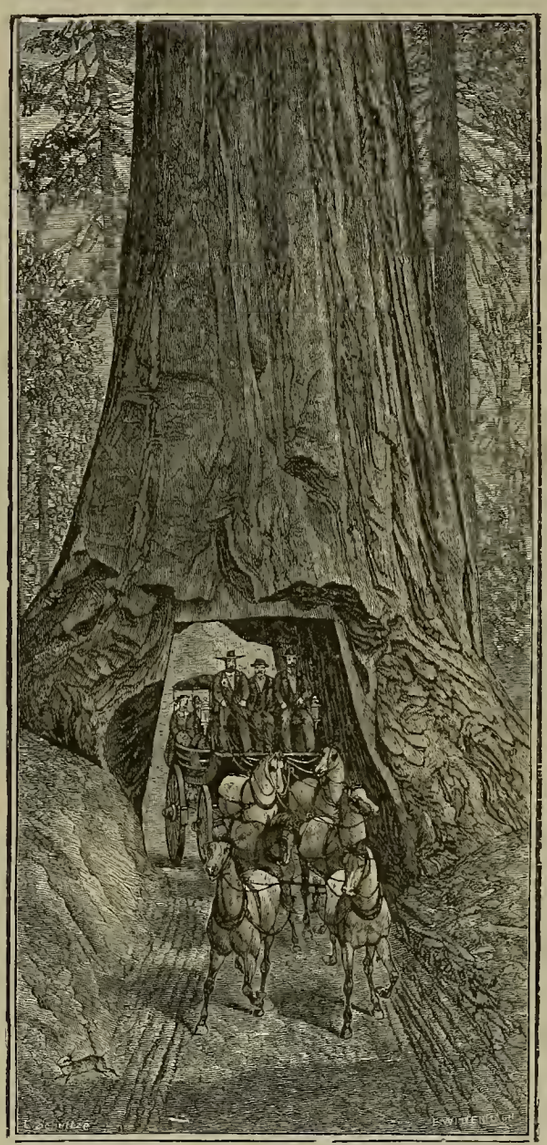
They show an immense deposit of copper on the surface, in some places the ledges of ore rising over 125 feet above the level of the surrounding country. Here, within a radius of one and a half mile from the enormous central ledge are 24 claims that are being worked by the company, all of them having shafts or inclines from 10 to 40 feet in depth, and showing ore veins with solid footwalls, the veins themselves being from 4 to 40 feet in width, and the ore they bear being very rich in quality.

Some of these claims show a great deal of iron, and one of them is rich in galena.

There is an abundance of wood in the surrounding country, but water has to be hauled a distance of 11 miles from Collin's wells on the old Ehrenberg stage road. Most of the ore dumps are approached by carefully graded wagon roads—the roads in question being, in fact, far better than those provided by the county.

A comfortable camp is centrally located with sleeping houses for the miners, dining-room, stable, etc.

There are at present five different companies negotiating for the purchase of this property. One party has already had their men on the road, while others are following. Two reports have been made by experts, both of which reports agree in placing their estimate of the amount of money in sight at an enormous figure, and there is no doubt that the negotiations now pending will bring about a satisfactory sale. When capital takes hold of them and erects the necessary smelter, these Harcuvar mines will prove to be the largest deposits of copper in Arizona.—*Phœnix Herald.*



WAWONA, MASIPOSA GROVE.

Sheep Ranch District.

One of the most productive mines in the State, the Sheep Ranch, is located in this district. The lode was discovered and located in 1865 by A. P. Ferguson. For a long period the mine was very successfully worked by crushing the ore in arastras. Then a five-stamp mill was put up, the mine continuing to enrich its owners. The original location was 1,400 feet in length, which was subsequently increased 200 feet by the purchase of the Bean claim, a contiguous location. A few years since the mine passed into the hands of capitalists, who have already increased its production by supplying it with all the modern appliances known to quartz mining. The shaft is now 600 feet deep. The pay chute, which is about 700 feet long, has been penetrated by six levels, and the ore stoped out between them. The average daily output of ore is sixty tons; quantity crushed daily, fifty tons. The mill, one of the best on the coast, has thirty stamps. The rock yields an average of $11 per ton; cost of mining and milling, $8.

The Chavanne mine, consolidated with the Sheep Ranch, has a shaft 400 feet deep, and a ten-stamp mill. All the machinery connected with the Sheep Ranch runs by steam. As before remarked, the Sheep Ranch is one of the most productive in the county, and has a very promising future before it.

There are several mines of lesser note in the vicinity, among which may be mentioned the Calaveras, Harrington and Andrews, Wheelock and Rodgers, and Amelia.—*Calaveras Chronicle.*

THE NORTH STAR MINES.—The well-known North Star mines, situated on the east fork of Wood river, and hitherto owned by J. O. Swift & Co., have, it is understood, been purchased by the Philadelphia Mining and Smelting Co. We understand that this company will immediately put a large force of miners on the North Star, as well as to ship what ore is on the dump, 2,000 tons, to their smelters at this place. The showing at the North Star is certainly fine. The mine is well developed, and thus admits of a vigorous working force; in fact, as many miners as the company desires to employ. The ore lies in a good, prominent ledge, and is of a beautiful smelting character.—*Ketchum Keystone.*

Opening Up a Mineral Region.

The southern terminus of the Carson & Colorado railroad is now at Hawley station, on Owens lake, about 300 miles from the Mound House, at the foot of the Panamint grade. Arrangements are now being made for running the trains to and from that point on the first of August.

New Life Given to All Kinds of Business.

As a consequence of the road coming in, a good deal of activity is now being evinced in that section in many kinds of business, and particularly in mining. From the number of valuable mines in that vicinity and outlying districts, a heavy output of bullion may be expected in a short time.

A Smelting Furnace in Blast at Darwin.

The smelting furnace of the Defiance mine, at Darwin, started up day before yesterday, with a large quantity of argentiferous ore on the dump.

Lumber and other material are now being shipped to Swansea, at the head of Owens lake, for the erection of a thirty-ton smelting furnace. The site of this smelter is directly on the road to Cerro Gordo, about six miles distant. The owners anticipate a large and successful business from the product of their own mines at Cerro Gordo.

Rich Ore from the Owens Lake Region.

Day before yesterday a car of ore from the Illinois mine came in to the Mound House. The ore is worth $600 per ton. It is destined for reduction works in San Francisco, and indicates the kind of ore they have down in the Owens lake country.

A Smelting Furnace and Sampler.

The Montezuma company's smelter is now at Bishop creek, and will be sent over and erected near the mine in a few days. This smelter can be run exclusively on a very large body of argentiferous galena ore now exposed in the Montezuma mine, independent of other ores that may be found by adjacent mining companies.

There is a sampler connected with this furnace, it being the intention of the company to buy all smelting ores offered in lots of from 500 pounds to 500 tons. This arrangement will be of immense benefit to the country in the vicinity of Bishop Creek, Alvord (formerly Big Pine), and all the adjacent camps.—*Virginia Enterprise.*

A Specimen Big Tree.

We present our readers with a view of "Wawona," one of the giants of the Mariposa Grove. It is well known that it is only by comparison that people generally arrive at correct conclusions. So discarding bare figures, the illustration speaks more plainly of the size of this mammoth, showing as it does, the loaded coach and six-in-hand bowling merrily through the tunnel hewn through its mighty trunk.

The two noted Big Tree Groves of California are the Calaveras and Mariposa Groves. The former contains the largest trees, but the latter is however more frequently visited by tourists, owing to its proximity to the Yosemite. The grant made by Congress containing the Mariposa Big Trees is two miles square, and embraces two distinct groves. The Upper Grove is in a quite compact body containing on an area of 3,700 by 2,300 feet in dimensions, just 365 trees of the *Sequoia gigantea* of a diameter of from one foot to twenty-seven feet, besides a number of small ones. The Lower Grove, which is smaller in size and more scattered, lies in a southwesterly direction from the other, some trees growing quite high up in the gulches on the south side of the ridge which separates the two groves.

WHISKY SLIDE DISTRICT.—The principal mine in this district is the Hoosier Consolidated. The Hoosier embraces three claims aggregating 3,600 feet. Development so far consists of two tunnels 150 and 200 feet in length respectively. Shaft 140 feet deep, with level at the bottom 130 feet long, shows 8,000 tons of rock in sight. There are also 700 tons on the dump, all of which will pay from $6 to $8 per ton. Six thousand dollars have been taken out by assorting the rock and working it in an arastra, the ore averaging $20 per ton. The Mary Long, one of the constituents of the Hoosier, has a 90-foot shaft, showing a two-foot ledge of $10 rock. A tunnel run in on the pay chute, which is 80 feet in length, furnished ore that paid $25 per ton. Although the tunnel worked the ground to the depth of only 40 feet, upwards of $10,000 were taken out. There are two shafts and several open cuts disclosing a four-foot vein and $8 rock. The vein can be worked by a tunnel to the depth of 950 feet; free water power during eight months of the year; remainder of the time water can be purchased. Two water ditches belong to the property. Ten stamps are to be put on the mine immediately, when it will unquestionably prove a very remunerative property. Whisky Slide mine shows a six-foot ledge of decomposed rock that will pay well. The Livermore mine has a shaft 200 feet deep, and a 10-stamp water power mill.—*Calaveras Chronicle.*

The Engineer.

Engineering and Canal Enterprises.

For a time it was believed that the railroad had literally bidden the canal to "dry up," and that the latter had nothing to do but ultimately to obey. The great Erie canal, however, has managed to hold its own, perhaps because backed by a State so powerful as New York; while Canada has opened the famous Welland canal, and persists in making it the main trunk of a permanent canal system in her territory. Just now a new impulse has for some reason been given to the idea of establishing such a system of water ways in the Dominion. It is proposed, briefly, to parallel the Erie canal by a Canadian system, that shall freight the products of the interior as cheaply as can be done by the Erie, and deliver them at the Hudson river with no less expedition than by their present route. This project is freshly proposed, too, in the face of still larger ones for constructing lines of railway through the whole extent of the Dominion, that are expected to constitute a parallel system to that of the trunk line roads which now traverse New York.

Steam is coming to supersede water power so effectually that it is already proposed to pull down the dams which impede the Connecticut river and its confluents, so as to make a continuous water-way from Lake Champlain and beyond to Boston harbor. The project is by no means so visionary as might appear to the one who had never considered its details. Assuming, however, that it is perfectly feasible, and that water power for manufacturing purposes is every year becoming more expensive to its owner, there is really no serious obstacle to the opening up of a canal and river system of communication with the Northwest, by which for at least five months in every year grain can be transported at low rates to Boston harbor, and here be stored in capacious elevators for foreign shipment. Such a canal system, supplementing and competing with the extended railway system, would work with miraculous influence in forcing forward the superb terminal facilities which Boston possesses to the utmost limit of development and expansion, and make this port an entrepot not surpassed by any on the Atlantic coast. *Exchange.*

The Suez Canal.—The Suez canal has proved a most astonishing success. The original shares of the company, which were $100, are now worth $450, and the last dividend was at the rate of 20 per cent. The traffic on the canal has increased from four and a half million tons in 1880 to seven millions in 1882. The traffic has now become so enormous, and is increasing so rapidly that the capacity of the canal will soon be entirely inadequate to the volume of business. It is in view of this fact that the second canal is proposed. The difficulty involved in this proposition grows out of the jealousy which exists between the French and English governments in regard to its management—the present management being French, under the Presidency of DeLesseps. The English are desirous of constructing a second canal, which shall be entirely under their control. Then, again, another difficulty arises, growing out of the claim of De Lesseps to the exclusive right to all canals across the Isthmus within Egyptian territory. Although the English do not yield their rights to cut another canal, under cover of their protectorship of the territory, still to avoid unpleasant complications, they are now looking for a route outside of Egyptian territory. Thus the matter stands for the present.

The Eads Jetties.—Those cities in commercial rivalry with St. Louis and New Orleans have insisted that the Eads jetties at the mouth of the Mississippi are a failure, and this, in spite of the repeated declarations of St. Louis and New Orleans journals to the contrary. The question has been, or ought to be, settled by the Government Engineer, who, after an accurate survey of the work, reports that there is in the river a channel thirty-one feet deep, and the least width of the thirty-foot channel is ninety feet. From the Gulf to the main river a passage is now afforded 160 feet broad and 26 feet in depth in the shallowest spot. This is better than has been claimed by the New Orleans papers, which believed that a depth of twenty-three feet in the channel as being equal, probably, to the largest vessel that would ever enter the mouth of the Mississippi. If St. Louis and New Orleans are pleased with the situation, that ought to prove satisfactory.

A High-Grade Railroad.—A railroad only 6,000 feet long, but with a grade of one-fifth rise in every five, on the average, and at the steepest, one in three, has been built straight up the Green mountain, near Bar Harbor, Me. The roadbed is solid rock, cut away to a plane, upon which the ties are bolted. The locomotive pushes a passenger car up the ascent by means of cog wheels plying in a center rail, as on the Mount Washington road.

The Mexican Central Railway is completed 105 miles, more than half of the entire distance from El Paso del Norte to the city of Mexico, and 15,000 men are at work in the construction department.

Useful Information.

Paint for Floors.

A paint for floors, which economizes the use of oil colors and varnish, is described in the German technical press as having been composed by Herr Marcck. It is remarked that this paint can also be used on wood, stone, etc. For flooring, the following mixture has been found applicable: Two and one-eighth ounces of good, clear joiner's glue is soaked over night in cold water. It is dissolved, and then is added (being constantly stirred) to thickish milk or lime heated to boiling point, and prepared from one pound quicklime. Into boiling lime is poured (the stirring being continued) as much linseed oil as becomes united by means of saponification with the lime, and when the oil no longer mixes there is no more poured in.

If there happens to be too much oil added, it must be combined by the addition of some fresh lime paste. For the quantity of lime previously indicated, about half a pound of oil is required. After this white, thickish foundation paint has cooled, a color is added which is not affected by lime, and in case of need the paint is diluted with water, or by the addition of a mixture of lime water with some linseed oil. For yellowish brown or brownish-red shades about a fourth part of the entire bulk is added of a brown solution obtained by boiling shellac and borax with water. This mixture is specially adapted for painting floors. The paint should be applied uniformly, and is described as covering the floor most effectually, and uniting with it in a durable manner. But it is remarked that it is not suitable for being used in cases where a room is in constant use, as under such circumstances it would probably have to be renewed in some places every three months. The most durable floor paint is said to be that composed of linseed oil varnish, which only requires to be renewed every six or twelve months. It penetrates into the wood and makes it water resisting; its properties being thus of a nature to compensate for its higher cost in proportion to other compositions used for a similar purpose. Its use is particularly recommended in schools and work rooms, as it lessens dust and facilitates the cleaning of the boards.—*The Builder.*

Glass Blowing by Compressed Air.

According to *Engineering*, the first in France to employ compressed air for glass blowing was probably a workman named Baccarat, who, in 1824, invented a small mechanical blower. A process which has been in use at the Clichy glass works of M. M. Appert, of Paris, since 1879, also dispenses with mouth blowing. Appert's apparatus is capable of blowing the largest pieces of glass, and it is extremely valuable from a humane point of view, as it prevents those maladies of the glass blower which arise from forced expiration and breathing hot, dry air. The apparatus, as described to the French Academy of Sciences, consists of two conjugate compressors put in action by the shafting of the works, and storing compressed air in reservoirs sufficient to serve 12 hours. It is distributed to the blowing apparatus by pipes with cocks, and controlled by a pressure regulator. In the Clichy works the air is employed under three pressures, one of 42 pounds per square inch, one of 14 pounds per square inch, and one of 2.85 pounds per square inch. The last pressure serves for the construction of goblets, jugs, lamps, bottles, and so on. The air is supplied to the glass by giving it an axial rotation similar to that of the blowpipe. The latter is fitted with a stop-cock by which the workman can regulate the air supply. The glass is rotated either on horizontal or vertical axes to suit the class of work. As the pre-acquired habits of the workmen have been consulted in this new apparatus, they readily become used to it. The new machine enables manufacturers to dispense with a number of the children formerly employed in this injurious work.

A Useful Solder.—A soft alloy which attaches itself so firmly to the surface of metals, glass, and porcelain that it can be employed to solder articles that will not bear a very high temperature can, it is said, be made as follows: Copper dust obtained by precipitation from a solution of the sulphate by means of zinc is put in a cast-iron or porcelain-lined mortar and mixed with strong sulphuric acid, specific gravity 1.85. From 20 to 30 or 36 parts of the copper are taken, according to the hardness desired. To the cake formed of acid and copper there are added, under constant stirring, 70 parts of mercury. When well mixed the amalgam is carefully rinsed with warm water to remove all the acid, and then set aside to cool. In 10 or 12 hours it is hard enough to scratch tin. If it is to be used now, it must be heated so hot that when worked over and brayed in an iron mortar it becomes as soft as wax. In this ductile form it can be spread out on any surface, to which it adheres with great tenacity when it gets cold and hard.

To Prevent Oil Fires.—M. Schlumberger recommends that a bottle of ammonia should be placed in each barrel of petroleum. On ignition, by accident or otherwise, the bottle would break and the ammoniacal vapors would at once extinguish the fire. Dr. Pietra Santa proposes to apply this method to collieries liable to fire-damp. Tanks filled with ammonia would, it is said, stop the combustion, as it could not continue in an ammoniacal atmosphere. *Athenæum*

Mud in Boilers.—In cases of externally fired boilers many must have noticed the snapping and bubbling sound at the bottom, after pulling down the fires with a strong draft on, prior to blowing down. This is due to the "mud" (organic and inorganic substances) which has settled during the night, while the boiler was losing heat on the lower side; the water becoming comparatively quiet on the inside. Under such circumstances the boiler may be compared to a pot of boiling mush. The steam bubbles are made at the bottom, underneath the mass of mud, and when sufficiently buoyant, come in contact with the colder water above, and are condensed, forming a snapping noise in collapsing. This never occurs in a clean boiler; with comparatively pure water. *N. H. Williams.*

Fly-paper.—A very good fly-paper may be made after the following receipt: Gum turpentine, 10 parts; yellow wax, 4 parts; lard, 14 parts. Melt, strain through a muslin cloth, and after solidification add as much oil (say linseed) as may be necessary to give the proper consistency on the paper. When prepared lay two papers together, face to face. If the above proportions do not give just the results desired, they should be varied by taking different quantities of the ingredients until a satisfactory material is made.

Scale in Boilers.—Among scale preventives, soap acts on both the carbonate and the sulphate, but the boilers get filthy, and sometimes a corrosive crust is formed. Baric chloride, decomposing the sulphate and liberating the carbonic acid of the carbonate, is largely used in Germany, with milk of lime, especially when the sulphate is the chief trouble. It reduces incrustration and repairs.

Mica Masks.—The use of face masks of mica, for the protection of metal and glass melters, stone masons, and other workmen exposed to heat, dust and noxious vapors, is found to be quite serviceable. These masks allow the eyes to be turned in any direction, and admit of the wearing of glasses.

To Remove Musk Odor.—Sulphate of quinine with a little acidulated water will remove the ordor of musk, perhaps the most pertinacious of odors.

Good Health.

Food Adulteration—Why We are Sick.

No device that can add to the comfort and convenience of a dwelling is omitted in our modern architecture, and money is not regarded when the luxury of clothing or beauty of personal adornment is in question. Hence we all live in better houses and wear better clothes than did our forefathers. Why should we not take the same better care of our health? Why should dyspepsia, and the train of diseases that follow it, almost unknown in the olden time, be so prevalent now? Simply because of the poisonous and indigestible trash which in these days is forced upon the public as a genuine food, or used to adulterate those articles that go to make up the daily bill of fare of every household. Our forefathers were content to make money by plain and honest methods, but the hot competition of the present day and the strife for rapid riches have called forth all the ingenuity of modern science to devise cunning deceptions that shall enable the avaricious dealer to more rapidly increase his profits, even though he destroy the health of the public thereby. The consequence is adulterated, impure, poisonous and bogus food on every hand.

The people buy these adulterated articles of food because they are cheap, entirely ignorant of their poisonous qualities. A few years ago this evil had reached such alarming proportions in England that the public sentiment demanded legislative interference, and Parliament enacted the most severe repressive laws. Dr. Small, U. S. A., after an examination recently made under the direction of the War Department, concludes that the adulteration of food is as great in this country to-day, and of as dangerous a character as it was in England at the time referred to.

It would be well for Congress to take hold of this important matter in a sufficiently vigorous manner to put an end to the whole nefarious business. In the meantime, if people will be as careful to buy the best and purest food as they are to wear the best clothes and build the most comfortable houses, it will not be necessary to ask so frequently the question, "Why are we sick?"

Origin of Yellow Fever.—A report has been received at the State Department, at Washington, containing the results of observations and experiments made by Dr. Freize, a Brazilian physician, who believes that he has discoved the cause of yellow fever in a microscopic parasite found in the blood of yellow fever patients. Experiments made by injecting this infected blood into the veins of rabbits and guinea pigs proved its virulence by producing death, the blood of the inoculated animal showing the same characteristics as that from the original yellow fever victim. The doctor's experiments seem to prove, also, that these parasitic germs of death survive in the soil where the subject of the fever is buried, and from thence may again contaminate living organisms, which would appear to favor cremation rather than burial in the case of yellow fever victims.

Serious Wounds that Fail to Kill.

A short time ago, a shoemaker of Astoria, N. Y., shot himself twice with a heavy pistol, once in the ear and once in the mouth. He was brought to the Roosevelt hospital, in this city, where it was discovered that the first ball glanced from the skull. The other is thought to be somewhere in the head, perhaps in the brain. Speedy death was expected, but the next day the patient walked away from the hospital, saying that he was sorry for the attempt on his life, but appeared to be in no immediate danger of dying.

With this case as a test, a writer in a morning paper reviews a large number of more or less marvelous cases of recovery from grievous hurts, showing that serious injuries to the main organs of the body are not always followed by death. Men persist in living, not only with bullets in their brain, holes in their stomach, dislocated vertebræ, and wounds in the heart, but even with open wounds clear through the body. During the civil war, Gen. H. A. Barnum, of Brooklyn, received in battle a wound which still remains an open passage through the body. For years the treatment of this wound has been simply to wear in it a roll of prepared lint, which is renewed daily. The supperation of the wound is constant, though variable.

Gen. Shields, of Missouri, had a similar wound extending through his body, and open in front and behind. His wound, it is said, was received in the Mexican war, and he wore, not lint, but a silk handkerchief in it. This he could draw directly through his body. *Scientific American.*

Action of the Heart.—As with each stroke the heart projects something like six ounces of blood into the conduits of the system, and as it does so some seventy times a minute and 4,200 times an hour, this implies that it does the same thing 100,800 times in twenty-four hours, 30,000,000 times a year, and more than 2,500,000,000 times in a life of seventy years. The mechanical force that is exerted at each stroke amounts to a pressure of thirteen pounds upon the entire charge of blood that has to be pressed onward through the branching network of vessels. According to the lowest estimate that has been made, this gives an exertion of force that would be adequate, in another form of application, to lift 120 tons one foot high every twenty-four hours. Yet the piece of living mechanism that is called upon to do this, and do it without a pause for threescore years and ten without being itself worn out by the effort, is a small bundle of flesh that rarely weighs more than eleven ounces. It is in the nature of the case, also, it must be remembered, that this little vital machine cannot be at any time stopped for repair. If it gets out of order it must be set right as it runs. To stop the beating of the heart for more than the briefest interval would be to change life into death. The narrative of what medical science has done to penetrate into the secrets of this delicate force-pump, so jealously guarded from the intrusion of the eye that it cannot even be looked into until its action has ceased, is, nevertheless, a long history of wonders. By means of the spygmograp—a writing style attached to the wrist by a system of levers and springs—the pulse is made to record actual autographs of cardiac and vascular derangement.—*Edinburgh Review.*

Inhalation of Air Exhaled by Consumptives.—Fresh proof of the danger of inhaling air exhaled by persons having lung diseases has been given by a characteristic French experiment. M. Giboux took four young, healthy rabbits from the same litter, and kept them for 105 days in cages, as follows: Two were placed in a cage where they were obliged to breathe the air expired from animals with consumption, twice a day for two hours; in a short time they became sickly, and on killing them, they were found to have tubercles in the lungs. The other two breathed twice a day the same air, but disinfected by being passed through cotton wadding impregnated with carbolic acid: these rabbits remained in good health, and were finally eaten by the experimenter.

Disinfectant for Sewers.—It has been discovered that the best disinfectant for sewer gases is the washings from gas works. This serves a double purpose—that of annulling the poisonous effect of the sewer gas and at the same time enabling persons having defective traps to detect it by the strong, pungent odor arising therefrom, while sewer gas alone, almost odorless, permeates the building, carrying sickness and death with it. The washings from gas works, at least, will not clog or obstruct even the smallest of sewers, while their presence, as above stated, might save life.

The Bite of the Leech.—The nature of the bite of the leech has been examined by M. Carlet. He detached the animal from the shaved skin of the rabbit at different stages. Suppose a scarifier, with three-toothed and equidistant blades, withdrawing from one another as they press into the skin, and operating several times successively in the same place; this gives a pretty exact idea of the mechanism.

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SAN FRANCISCO:

Saturday Morning, Aug. 11, 1883.

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Iron Foundry—J. M. Lakenan, Grass Valley, Cal.
Dividend Notice—Standard Con. M. Co., S. F.

Passing Events.

The city is just now busy in preparation for the Conclave week, and the Knights Templar are arriving daily. Many buildings and public places are being finely decorated, and San Francisco will soon be a gala array. The Governor has made a legal holiday of that on which the corner-stone of the Garfield statue in the park will be laid.

Mining news of moment is not abundant just now. The Lower California placer mines are again attracting attention. The impending strike at the Wellington collieries, B. C., will have some effect in our coal supply here, possibly. The advance of the cholera into China is not by any means assuring, and steps are being taken to enforce a rigid quarantine.

WELLINGTON COLLIERY STRIKE.—The miners at the Wellington coal mines, British Columbia, have notified the proprietors that it is their intention to go on a strike, for the reason that they have demanded an increase of pay. There are 300 miners engaged at the mine, and the threatened action will throw out of employment not only themselves, but upward of 1,000 others, who are engaged in various capacities at and around the mines at Departure bay. About 14,000 tons of coal a month come to this port from these collieries. It is stated that the colliery miners intend bringing about 1,000 Chinamen from China to work in the mines.

Lodes in Placer Claims.

The conflicting interests of lode and placer claims, particularly as connected with the side surface ground of the former, are constantly coming to the front. A short time since a lode owner filed an application for patent on a lode, part of which was on a placer claim owned by others. The placer owners asked the Land Office to dismiss the lode application on the ground that the greater portion of the lode claim was on their placer claim.

The Land Office, on denying the motion to dismiss the application, held that there existed prior to the date of application of the placer owners, the lode claim referred to, and as the vein or lode was known to exist, it was expressly excepted from the patent of the placer claim. The matter was appealed to the Secretary of the Interior by the placer owners. It appears, from a copy of certificate of location filed, that the Mandelle lode was located March 21, 1879, by John McKenzie, A. A. Swan and Thomas Guest. The application for the Searl placer was filed July 5th, and that of the Olathe July 7th, 1879. Finn claims, under locations made by himself May 10th and June 11, 1881, and also claims, through various conveyances, to be possessed of the claim originally located by McKenzie, Swan and Guest, and that they are one and the same lode or claim.

In the case of Becker et al. vs. Sears, the Hon. Secretary of the Interior held that Section 2333, U. S. R. S., carves out from a patent to a placer claim all known lodes found therein *at date of application*, together with twenty-five feet of surface ground on both sides as incident thereto. The Secretary did not think he had sufficient evideuce before him showing that the lode in question was really known to exist at the date of the placer applications. Furthermore, it does not appear that the lode claimant filed any adverse claim against either of said placer applications, and having failed to do so within the statutory period, he had to, under the decision of the Hon. Secretary in the case of the Shonbar lode, if entitled at all, be restricted to his lode claim, and only twenty-five feet of surface ground on each side.

The Secretary decided that before application for the lode claim can be received, applicant must affirmatively and satisfactorily show his acquaintance with and the actual existence of the lode and mine, and its true location within the placer, and that existence was known prior to date of the placer applications, and he must set forth such facts as clearly show how the existence of such lode at that time became known, and a statement under oath of mere conclusions or opinions will not be sufficient to establish the existence of the lode. Applicant's affidavit must be full, clear and specific upon the points indicated. He must also prove his possessory right and value of work as in other applications, and, in additiou to the other proofs required by law and official regulations in mining applications, the allegations of applicant above mentioned must be satisfactory and fully corroborated by at least two disinterested and credible witnesses familiar with the facts. Such a showing the applicant failed to make.

The Secretary of the Interior, however, instructed the Commissioner of the General Land Office that, should applicant make such showing and present such application under oath for the lode, showing its actual location and extent by plat and field notes, such application, restricted to the lode and twenty-five feet of surface on each side should be received, and applicant allowed to proceed under the statute.

For the reasou stated, though, the applica tion of the lode claimant, upon his showing, was rejected.

MINING ENGINEERS.—The autumn meeting of the American Institute of Mining Engineers will be held at Troy, N. Y., during the second week in October. This meeting will be mainly devoted to the reading and discussion of papers. A feature is that members who wish their papers fully discussed at the meeting, can have them printed and circulated in advance if they are sent to the Secretary early in September.

TUOLUMNE.—Mr. Fred Asbeck of Soulsbyville, Tuolumne county, tells us that he has bonded his mine, and it is being prospected so far with success. There is renewed activity in mining about Soulsbyville, for several companies have started up again.

Falls of Roof and Sides.

It is the experience of coal mining that the falls of roof and sides by which lives are lost are almost always the result of the carelessness of the miners. Some men, either from natural fearlessness, or from the daily contact with and exposure to danger, become so reckless that an accident is almost certain to overtake them sooner or later, and not only their own lives, but those of their partners, or those less skilled, who may be working with them, are placed in jeopardy. It is noticeable, too, that fewer accidents occur in places which appear the most dangerous, owing to the care with which they are treated, and to the great attention paid to the timbering; and no stronger proof can be wanted that many of these casualties might be avoided if closer and more systematic examination were made by the workmen themselves, as well as by the overmen, firemen and other responsible officials of the colliery.

There is the greatest possible difficulty in making the workmen attend strictly to the special rule requiring sufficient "sprags" to be kept set while they are engaged in holing under the coal. If the rule received constant attention, there would be very few accidents. If temporary props were placed under the roof whilst the men are loading, it would enable them to save themselves when they first hear a breakage in the roof; but the prevailing practice is to do all the work of removal under the roof after the support has been taken away, and then do the permanent propping. A source of danger which is but too often disregarded, arises from visible slips in the roof. In this, both the colliers, the firemen and the managers are to blame. As blame is so often attributable to all concerned, it is very difficult to bring a charge home to a manager for even a gross neglect.

Falls of roof often occur by reason of an insufficient testing and watching of the superincumbent strata; sometimes they can be traced to the venturesome folly of working under a roof carelessly, and often insufficiently supported. Others arise from the neglect of the observance of the special rules with respect to the spragging underneath the coal before holing the same. In an occupation such as this, accidents from falls must necessarily occur, but they are not at present reduced to a minimum. Frequent supervision is absolutely necessary, but this alone will not have the effect so much to be desired. The workmen who are continually in their places ought to be always on the watch, and it is their duty to place timber at stated distances, whether required or not; and often it is unwise to trust to any fixed rule; but in cases where the roof is tender, and consequently treacherous, they should timber accordingly. It is better far that a little extra labor and consequent loss of time should be given than run any needless risk.

For the most part the timbering of the roofs at the faces, where most of the falls occur, is done by the colliers themselves, and therefore their safety is, in a great measure, dependent on their own care and skill. The workmen for the most part set their own timber, though generally speaking, they do not draw it. This is done by a class of men for the purpose. During the shift, the men themselves are, or ought to be, the most competent judges where and how to set props, by reason of their remaining in the place the whole time, and being able to form a judgment from surrounding circumstances; but at the same time those in charge are answerable, and very properly so, for the fulfillment of this necessary duty. The importance of enforcing a system of regular propping is urged upon miners by the English inspectors of mines. This is now practiced in a great measure at pillar working. When the mode of systematically removing pillars on a large scale was first adopted in Scotland, propping of the roof was conducted on very much the old style of propping where the roof appeared to be unsafe, and the consequence was, that there were more accidents from falls of roof than in any other mode of working. Gradually since then the adopiton of the better plan of setting up an excess of props beyond that needed for the actual safety of the miner, has been introduced, whereby the roof is thoroughly steadied until the coal is removed, and there are now fewer accidents. The wood is also drawn out with greater safety. In longwall, on the other hand, the general practice is only to prop the roof where it appears to be unsafe.

Color Tests for Ores.

During the first part of the process of scorification of ores that have not been roasted, or only partially so, the colors of the fumes given off will often indicate the nature of the ore. Thus sulphur emits clear gray vapors; zinc, blackish vapors and a brilliant white flame; arsenic, whitish gray vapors; and antimony, fine red vapors.

The colors shown by the interiors of scorifiers, after scorification, are often characteristic, and Mr. Walter Lee Brown, in his "Manual of Assaying," gives a short list of colors in scorifiers which are of interest to miners. Lead tends to color the scorifier a lemon yellow. Iron colors it in various shades of reddish-brown, from a brick-red to a deep, rich mahogany. Copper, according to its percentage, gives a green, varying from a brick-red to a deep, rich mahogany. Copper, according to its percentage, gives a green, varying from light to very dark. Tellurium colors the scorifier a deep blood-red. Combinations of the metals are liable to influence these colors and produce mixed shades.

In addition to these colors in scorifiers, the color and appearance of a cupel are occasionally indices of the metals present in the ore. We quote from different authorities on this point:

Antimony—Litharge-yellow to brownish red scoriæ. Cupel often cracks. (Mitchell.)

Arsenic—White or pale yellow scoriæ. (Triplett.)

Besmuth—An orange-yellow color. (North.)

Chromium—Dark brick-red stain. (Triplett.)

Cobalt—Dark-green scoriæ, greenish stain. (Triplett.)

Copper—Dark brick-red stain. (Triplett.)

Cobalt—Dark-green scoriæ; greenish stain. (Triplett.)

Copper—Dark purplish-black stain, sometimes with a greenish cast, or even a brown; at times a gray or dirty red. The edges show a purplish-red tint. There is generally a *rose* coat on the outside of the cupels from ores such as copper, which need not be mistaken for the rose color of oxide of silver. (Brown.)

Iron—From light through dark-brown to almost black; corroded rings or cupel. (Brown.)

Manganese—Lemon-yellow, straw or orange-yellow.

Palladium and platinum—Greenish stains and crystalline buttons. (Triplett.)

Tin—Gray scoriæ.

Zinc—Yellowish ring or cupel; often causes loss of silver by ebulition; flame very luminous. (Brown.)

Lower California Gold.

The recent excitement about the Lower California gold mines seems to be about reviving. It was at first announced with great flourish that very rich placers had been found, and that many miners were rushing there. Then came the news that many who went were greviously disappointed. There was less gold than was expected, and there was no water at all. The whole thing quieted down. Now, however, comes a dispatch from Guaymas, dated the 8th inst., which brings up the matter again in the following form:

"By the arrival to-day from Trinidad of the sloops *Emelia* and *Sarregosa* the following startling news from the placers is brought: Prospecting has been persevered in, and the present extent of the placers is some forty by sixty miles. Rain has fallen, and water for drinking purposes is plenty, but the ground in such a condition that dry washing has been abandoned for the present. Provisions also have nearly given out, but a train is now on the way from here. Flour is scarce at $2 a pound. Beef, none to be had; also coffee and sugar. Jose M. Garcia came over on the *Emelia*, and will leave on her return with a stock of provisions. The two vessels brought over some thirty pounds of gold, in the hands of the different passengers, two of these pieces being remarkable for size and richness, the largest weighing, rock and all, eight and three-fourth pounds, and the other, solid gold, four and a half pounds. Up to the time of the rainfall the dry washers were making from $20 to $30 per day."

By the same mail comes the news that a Mexican gentleman, named Juan Diaz, had died of thirst at the placers. And also a speck of trouble in regard to the placers, from the fact that there are two parties claimiug the mines. Altogether, this part of Lower California needs to be very rich indeed to tempt a man to try his fortunes there.

Blocking Out in Alluvial Mines.

The following description of a system of blocking out followed in the alluvial mines at Huntly and Bagshot, Bendigo, during the past seven years, is taken from a special report on the subject by H. B. Nichols, Inspector of Mines at Sandhurst. He says that no accident has occurred from a fall of ground since the system was first introduced in these mines. The main and block drives are timbered, as shown in Figs. 1 and 2. These blocks are commenced at sixteen feet from the main drive, as that distance is considered necessary for the security of the permanent works. In Figs. 1 and 2 the laths overlap, and are placed in dry ground the distance apart shown, whilst in very soft or wet ground each lath stands separately on its own timber and close together, as shown in Figs. 3 and 4. In each case the laths and props decrease in size from the drive towards the back of block, because it is considered desirable to allow the ground at the back of the block to collapse as soon as possible after the "bottom" (wash-dirt) is taken off. The maximum thicknesses of the props and slabs used near to the drives are five inches and one inch and a half respectively, and the minimum thicknesses at the back of the blocks are one inch and a half for props and three quarters of an inch for slabs. If the block or roof stands up any time, is swaying, or, to use the miners' term, "talking," the props are knocked from under the back laths and the block is let down, thus relieving the front laths of the weight and saving the drive from crushing. This method of blocking is the safest and cheapest way to work alluvial ground. The safest, because each lath stands on its own timber, and there is no shaking of the roof by driving laths and no fear of knocking the timber out; and the cheapest, because the timber is lighter to handle, cheaper in price, no false sets are used, nor anything cumbersome. If the ground is very soft or heavy, the blocking drives are put in first, and the miners then block back on both sides and let the ground down in working back. In dry ground they take the block up on one side of the drive, as shown in Fig. 1, and bring it back on the other, always letting the roof down at the back.

In driving, the sets shown in Figs. 1 and 2 are considered the best. If the ground is very heavy, the cap of the set over which the laths are to be driven is dogged with two strong iron dogs to the back sets which have weight, and a horned false set is used. This is very quickly done, if, when the set is made, an auger-hole is bored in each end of the cap; it will then be ready for dogging, and when the set is up the dogs are easily withdrawn. In driving through heavy ground four-foot slabs are generally used, and occasionally slabs of four feet six inches. In blocking out, however, four feet six-inch slabs are always used.

When the alluvial drift in which the mining operations are carried on becomes very heavy between each set, a "dummy" prop and cap are added. The props are eight to twelve inches in diameter, and the caps used are two to three feet long by six to eight inches in diameter. These are put in to protect the drive, as shown in Fig. 5.

In working very soft ground by this system, and supposing the miner to be in the face, or commencing to block out, he takes a lath six to eight inches wide, and a prop about two inches in diameter, each of the required length; he places the prop under the center of the lath, which he holds with one hand against the face, and, with a light pick in the other hand, he scratches away the drift (sand) in front of the lath until it is in the full width; then, placing a prop under each end of the lath, he removes the center prop and takes out the wash-dirt.

One manager of long experience in this division, in describing this method of working soft ground, says; "I have seen miners put in laths by holding the center in one hand, forcing the lath against the face, and with the fingers of the other hand work out the sand until the lath was in its place; then prop the ends, remove the center and take out the wash." He further mentioned, to show the superiority of this system as compared with the old one, "that he had seen a miner working in ordinary ground, using two foot nine inch props, excavate a block four feet wide by sixteen feet in length in eight hours, and at the same time, as his work progressed, he put in sixteen laths and twenty props. This was in dry ground, where the laths lapped, and were placed one foot apart." Under the old system of blocking out and excavation, four feet wide by eight feet long is considered a good eight hours' work.

Foundry Notes.

Savage and Sons.

Messrs. Savage and Sons are proprietors of one of the old foundries in this city, having been in the business altogether some fourteen years. They have several specialties, among which are house front castings. They did this part of the iron work on both the Palace and Baldwin hotels, and many other large buildings in this city. They have just finished two large iron fronts, one of which is for the Sandwich Islands. They are at work now on the cast iron for the addition to the State Insane Asylum. The foundry has always done a large amount of this house work.

A specialty is also made of sawmill work, modern sawmill machinery of the best type being manufactured. They are now engaged on a mill for Bellingham Bay, to cut 100,000 feet of lumber per day. Heavy engines are made to accompany this class of machinery.

Another thing of which large numbers are being made here is the Dodge rock breaker, for which the trade is increasing since the recent improvements by the inventor. Steel pins are inserted in the wrought iron crushing faces, which makes the crusher more durable and effective. Mainly two sizes of these machines are made. They also make the Dodge concentrators, dry and wet, and the Dodge pulverizer.

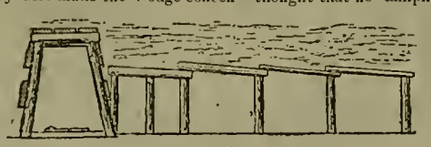


Fig. 1.



Fig. 2.



Fig. 3.



Fig. 4.

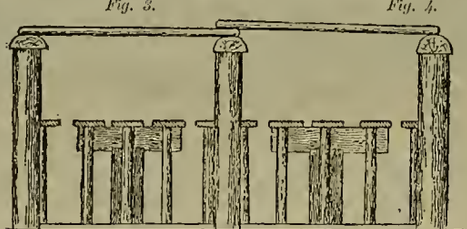


Fig. 5.

BLOCKING OUT IN ILLUVIAL MINES.

Another specialty of these works is the French range, of which they make great numbers for the wholesale and retail trade. The demand for these is general all over the State and coast. Mantel grates and light cast-iron pipe, with fittings for plumbers' use, are also made.

They do general jobbing work for the smaller machine shops that have no foundry. Jobbing work is light, however, at present.

Among other things of which this foundry makes a specialty, is ship work. They make gypsies, house pipes, chocks, and all that class of articles for vessels. Trade has been good in this branch this year. Among other things on which they are at work just now are the two curves complete for the Sutter street cable railroad. These curves are to be put in at Polk street.

THE Trinity *Journal* of August 4th says: Mining is as nearly at a stand-still in this county at the present time as it ever gets to be. There is no water at all for hydraulic mining purposes, nor yet enough for grinding quartz in arastras. About all the mining that is being done now is along Trinity river, the season being particularly favorable for wing-damming. Placer miners will soon begin the work of fitting up their claims for next season's run.

LORD DERBY has advised the Australian Colonies to take the eastern half of New Guinea and the Western Pacific islands under their joint protection on their own responsibility. He said he could not advise the government to extend the Queen's dominions any further.

ALL cattle arriving at ports of the United States from any part of the world, except North and South America, will be subject to quarantine for ninety days from the date of shipment.

Blasting in Mines—No. 3.

Tamping with black powder, clay is perhaps best, but soft rock, sand, etc., are often substituted. The idea of using plugs, cones and similar devices for blocking the hole is apt to be periodically revived by enthusiastic inventors. Their history dates back through the last two centuries. There have been several attempts to introduce them into use of late years in the United States, but it is hardly worth while here to notice any of the proposals, as they have not come into general use. With pure nitro-glycerine, no tamping is needed but water; therefore, nitro-glycerine, having greater specific gravity than water and no affinity for it, is an especially suitable agent for subaqueous blasting, where it can simply be poured down into the holes through a tube and funnel. Where the rock is split or seamy, nitro-glycerine must be encased in some substance, say tin cases, and this, it is said, lessens its explosive force by preventing close contact. Where the rock is firm, it can be poured directly into the hole. In this respect dynamite has a great advantage over nitro-glycerine, in that it can be charged in roof-holes and in seamy rock, there being no danger of running out, leakage, etc. In charging No. 1 dynamite, it was formerly thought that no tamping would be required, but the general experience of blasters has led to the practice of tamping the holes solidly to the lip with clay. The fact that tamping is not so essential with the high explosives as with the lower ones, should not be taken as proof of any radical difference in the theory of tamping being required in both cases. The law of tamping is the same, for in both the disruption is effected by the sudden liberation of expansive gas; only in the one case the liberation of gas is instantaneous, and in the other gradual. In either case, strong confinement promotes the effect.

The vacancies about a charge do have a practical effect in reducing the force of explosion of nitro-glycerine or of its compounds is shown by the following record. The experiments were made at the works of the Atlantic Giant Powder Company with the mortar. The charge used with each shot was one-quarter ounce of No. 2 dynamite, and the object of the experiments was to see whether a small space left between the ball and the bottom of the bore would have any appreciable effect in lessening the distance the ball was thrown:

	Shot Raised.	Thrown.	Loss.
No. 1	00 inch	630 feet	00 feet.
No. 2	1-20 inch	5 9 feet	51 feet.
No. 3	2-20 inch	550 feet	80 feet.
No. 4	4-20 inch	490 feet	140 feet.
No. 5	8-20 inch	440 feet	190 feet.
No. 6	12-20 inch	400 feet	230 feet.
No. 7	16-20 inch	350 feet	280 feet.

THERE is great excitement in Hungary over the result of the trial of the Jews accused of murdering Esther Solyman. At Presburg a mob of anti-Semitics gathered, and became so hostile in their demonstrations against the Jews that the authorities were compelled to order out the military to disperse them.

Mineral Products of the United States.

A report entitled "The Mineral Resources of the United States" is now in press, and will shortly be published by Mr. Albert Williams, Jr., Chief of the Division of Mining Statistics and Technology, United States Geological Survey, Hon. J. W. Powell, Director. This report is for the calendar year 1882, and the first six months of 1883. It contains detailed statistics for these periods, and also for preceding years, together with much technical and descriptive matter. The compilation of special statistics has been placed by Mr. Williams in the charge of leading authorities in the several branches, and the results will therefore be accepted with confidence. The following totals of production are compiled from advance sheets:

It is impossible to state the total mineral product in any form which shall not be open to just criticism. It is evident that the production statistics of such incongruous substances as iron ore; metallic gold and silver; the spot value of coal mined and the market value of metallic copper after having been transported hundreds of miles; the spot value of a crude substance like underground, unrefined barytes, and the value of a finished product like brick (in which the cost of manufacture is the leading item), such details cannot well be taken as items in a general summary. The statistics have been compiled with a view to giving information on those points which are of most interest and utility, and are presented in the form usual in the several branches of trade statistics. The result is that the values stated for the different products are necessarily taken at different stages of production or transportation, etc. Theoretically, perfect statistics of mineral products would include first of all the actual net spot value of each substance in its crudest form, as taken from the earth; and yet for practical purposes such statistics would have little interest other than the fact that the items could be combined in a grand total in which each substance should be rated on a fairly even basis. The following groupings, therefore, are presented with a full realization of the incongruity of many of the items:

VALUES OF THE METALLIC PRODUCTS OF THE UNITED STATES IN 1882.

Pig iron, spot value	$106,336,429
Silver, coining value	46,800,000
Gold, coining value	32,500,000
Copper, value at New York City	16,038,091
Lead, value at New York City	12,624,550
Zinc, value at New York City	3,646,620
Quicksilver, value at San Francisco	1,487,537
Nickel, value at Philadelphia	309,777
Antimony, value at San Francisco	12,000
Platinum, value at New York City	1,000
Total	$219,756,004

VALUES OF SOME OF THE NON-METALLIC PRODUCTS OF THE UNITED STATES IN 1882 (ALL SPOT VALUES, EXCEPT CHROME IRON ORE.)

Bituminous coal, brown coal, lignite, and anthracite mined outside of Pennsylvania	$76,076,487
Pennsylvania anthracite	70,556,094
Crude petroleum	23,704,698
Lime	21,700,000
Building stone	21,000,000
Salt	4,320,140
Cement	3,672,750
Limestone for iron flux	2,310,000
Phosphate rock	1,147,830
New Jersey marls	540,000
Crude borax	338,903
Mica	250,000
Crude barytes	160,000
Chrome iron ore, value at Baltimore	100,000
Soapstone	90,000
Manganese ore	52,500
Asbestus	36,000
Graphite	34,000
Sulphur	21,000
Cobalt ore and matte	15,000
Precious stones, uncut	12,500
Asphaltum	10,500
Corundum	6,250
Punice-stone	1,750
Total	$226,156,402

RESUME OF THE VALUES OF THE METALLIC AND NON-METALLIC MINERAL SUBSTANCES PRODUCED IN THE UNITED STATES IN 1882.

Metals	$219,756,004
Mineral substances named in foregoing table	226,156,402
	445,912,406
Fire-clay, kaolin, potter's clay, common brick clay, terra cotta, limestone used as flux in copper and lead smelting, iron ore used as flux in lead smelting, pyrites (for acid making), zinc white made directly from ore, marls (other than New Jersey), apatite, gypsum, tin ore, bismuth, arsenic, iridosmine, mill buhrstone and stone for making grindstones, lithographic stone, talc (other than "soapstone"), quartz, feldspar, fluospar, terra alba, chalk, crude mineral paints, nitrate of soda, carbonate of soda, sulphate of soda, native alum, ozocerite, mineral soap, strontia, etc. certainly not less than	8,000,000
Grand total	$453,912,406

The grand total might be considerably reduced by substituting the value of the iron ore mined for that of the pig iron made; by deducting the discount on silver; and by considering lime, salt, cement, borax, etc., as manufactures. It will also be remarked that the spot values of copper, lead, zinc, and chrome iron ore are much less than their respective values after transportation to market.

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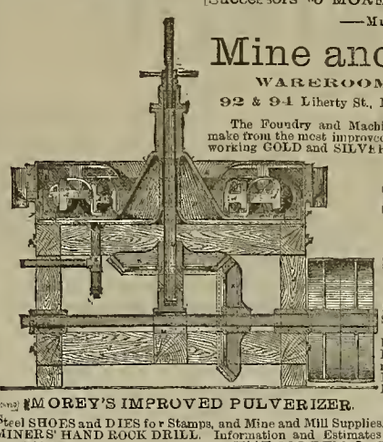
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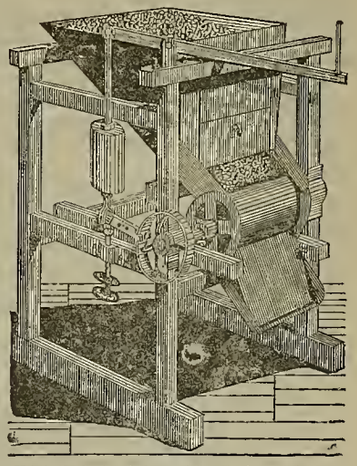
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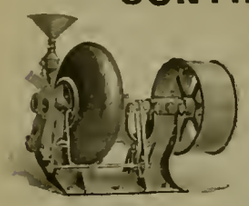
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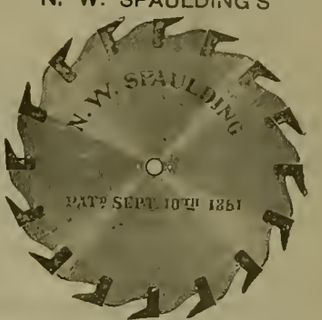
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This is the only Scientifically Constructed Bucket in the market. It is struck out from charcoal stamping iron. No corners to catch. No seams to burst. No interior corners to clog up. It runs with great ease, and half the power of the old style bucket. WILL OUT-WEAR HALF A DOZEN OF THEM.

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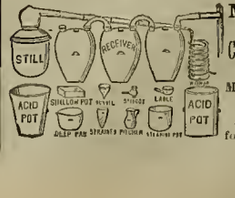
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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR THE WEEK ENDING JULY 31, 1883.

282,251.—BORING-BRACE—A. H. Adams, Santa Rosa, Cal.

282,183.—CIGAR AND CIGARETTE HOLDER—Jos. Fletcher, Livermore, Cal.

282,316.—PREPARING SKINS—A. Hesthal, S. F.

282,193.—FRUIT JAR—Geo. F. Hoeffler, S. F.

282,108.—HORSESHOE—O'Hara & Remington, Gilroy, Cal.

282,217.—HEADER, THRASHER AND SEPARATOR—W. H. Parrish, Salem, Ogn.

282,422.—PULLEY—A. Walton, S. F.

282,141—ROAD SCRAPER—A. Womack, Emmetsville, I. T.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

California Machinery Abroad.

We have always sent more or less of our California machinery to Australia, the Pacific islands and to Mexico, particularly the latter place. The mining machinery made here has a world-wide reputation, and large quantities of it have been sent to Mexico, as well as some to Central America. We have had so many years of experience here in mining aud metallurgical appliances, that others desire to benefit by it, aud come here to purchase. A fresh instance is worthy of record.

For many years the copper production of Chili has been from seventy per cent to seventy-five per cent of the world's production. In consequence of a falling off in the grade of the ores, as well as competition from Spain and the United States, the output has been gradually diminishing during the past few years. Up to this time only the slow and crude process of reverherating aud stone-blast furnaces have heen used, which, even in a country of cheap lahor, cannot stand the competition of improved mechanical appliances. Waking up to the necessity of adopting the latest American improvements, which have stimulated production so largely in this country for the past few years, a representative of some of the principal mines in Chili recently visited this city for the purpose of familiarizing himself with the improvements referred to. After a thorough investigatiou of the whole matter, an order was placed for one of the famous Pacific copper smelters of Rankin, Brayton & Co., of Sau Fraucisco, with the assurance that if such results are obtained there as are universally given in this country, they will adopt them for their whole system of mining.

The gentleman referred to expressed great astonishment at the facts suhmitted in regard to the cost of haudling ores with this smelter, and admitted that for the effective and ecouomical treatment of all classes of copper ores, no other process in the world could compare with it. This evidence of the appreciation of an American invention, coming from a people slow to adopt new ideas, especially foreign ones, is a marked instauce of the progressive character of that people, as well as another gratifying assurance of the admitted superiority of Pacific coast mining machinery.

JAMES S. WATERMAN, who died recently in Chicago, was the founder of the town of Sycamore, Illinois, and its wealthiest citizen. With his brother, R. W. Waterman, of the Hot Springs, near San Bernardino, he owned one of the very richest of mines on the Mojave Desert, near Calico district. With his wife, Mr. W. recently spent several winters in southern California, forming warm attachments among the good citizens of San Bernardino and Riverside, who sincerely sympathize with Mrs. Waterman, and other relatives of the deceased.

A Confident Subscriber.

[From Pacific Rural Press, 8 F.]

Rufus Fiske, of Santa Clara county, who shows his faith in the RURAL PRESS by paying his subscription two years in advance, writes as follows:

"Your paper has become such a valuable aid to me in my business of farming that I cannot afford to be without it. Not only every farmer ought to have it, but all who are interested in the welfare and development of the State. Success to you in the future as well as in the past."

INFORMATION is wanted at this office of one Joseph Craig, formerly of Cass county, Illinois, who came to California in 1849.

A Slander on the Northwest.

The following paragraph was inadvertently published last week:

A GOOD COUNTRY FOR THE DOCTORS AND UNDERTAKERS.—The following is clipped from an exchange, and will prove interesting to persons who intend leaving for the Northwestern country: "The undertaking business flourishes at Portland and elsewhere throughout Oregon. What with malaria, quinine and whisky, and the debilitating effects of a long journey in steerage and emigrant car, Death's sickle reaps a large harvest, the children especially dropping off like rotten sheep. But still the Northwest is filling up, and everbody is confident about the grand time coming."

We are perfectly sure that this is a great slander upon the State named, and the only object in publishing it should be to denounce it and warn all readers that it is not worthy of credence. No doubt the journey undertaken by emigrants is often a hard one, and a severe test to those in delicate health and to children, but the idea that the mortality is great among them is wholly false. Most of them are strengthened and invigorated by a change of scene and air, and many who are not strong at starting become vigorous by the journey. The inference that Oregon is an unhealthy State is an unwarranted one. There is sickness there, of course, as there is everywhere, which is owing to various causes, but the climate of the State is salubrious and desirable. The Northwest is filling up, it is true, and the people are confident of its future, as they have reason to be. Those who are disposed to take part in the development of its rich resources should not be misled by false reports which bear upon their face the stamp of exaggeration and falsehood.

SACKETT SCHOOL.—This well known and popular school at Oakland, has opened the new year of work with an enlarged corps of instructors and a gratifying increase in students. The aim of the school has always been to do thoroughly the work that is attempted. None but the best of instruction is furnished, and the hours of recitation have this year been lengthened in order to give more attention to each student. We are glad that such wise and liberal provisions are meeting a just and worthy response at the hands of discriminating parents who have sons to educate away from the home roof. We heartily commend all such, with personal knowledge of what we say to the Sackett school.—*California Rescue.*

OUR EXPORT TRADE.—The *Grocer* remarks that while the growth of the State in some directions during the past ten years has not been so rapid as might be desired in one department at least, that of foreign exports, an extraordinary increase has occurred. Statistics compiled at the Custom House in this city show that the total value of these exports increased from $20,310,722 for the fiscal year ending June 30, 1874, to $44,143,363 during the last fiscal year, an increase of $23,832,641.

NOTHING builds up shattered constitutions so quickly as Brown's Iron Bitters.

Successful Patent Solicitors.

As Dewey & Co. have heen in the patent soliciting business on this coast now for so many years, the firm' name is a well-known one. Another reason for its popularity is that a great proportion of the Pacific coast patents issued by the Government have heen procured through their agency. They are, therefore, well and thoroughly posted on the needs of the progressive industrial classes of this coast. They are the best posted firm on what has been done in all branches of industry, and are able to judge of what is new and patentable. In this they have a great advantage, which is of practical dollar and cent value to their clients. That is this understood and appreciated is evidenced by the uumber of patents issued through their SCIENTIFIC PRESS Patent Agency (S. F.) from week to week and year to year

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

G. W. MCGREW—Santa Clara county.
M. P. OWEN—Santa Cruz county.
J. W. A. WRIGHT—Merced, Tulare and Kern counties.
JARED C. HOAG—California.
B. W. CROWELL—Arizona Territory
M. H. JOSEPH—Eureka, Nev.
I. M. LEHY—Los Angeles, San Bernardino and San Diego counties.
A. C. KNOX—Oregon and Washington Ter.
J. J. BARTELL—Yolo county.
E. P. BILLINGS—San Luis Obispo Co.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $4 a year, in advance. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times,) by turning a leaf.

News in Brief.

THE Texas fever has broken out at Dodge city, and cattle are dying off in great numbers.

Two Indians have been hanged for the murder of two white men at the Harrisburg mines, in Alaska.

THE Canadian Pacific managers state that 2,000,000 bushels of wheat will be sent to tide water this season from Manitoba.

THE Lexington Mining Co., of Butte, Montana, paid its first dividend of $220,000 on the 1st of July, in Paris, where the owners chiefly reside.

THE Silver Buttes mine produced $21,700 in July, with an expense of $14,272. The Plumas Eureka produced $38,975, with an expense of $22,095.

JOHN C. NEW, Assistsnt Secretary of the Treasury, is said to have been finally converted to the idea of abandoning the coinage of standard dollars.

THE delay in the completion of the Brooklyn bridge cable line is caused by the necessity of waiting for an expert cable splicer from San Francisco.

FRANK LESLIE, a government scout, informs the Tombstone *Epitaph* that several small bands of Chiracahuas are on their way to the San Carlos reservation.

A CHARTER for the St. Louis, California and Denver railway has heen filed at Topeka. The railroad is to be 1,000 miles long. The capital stock is $30,000,000.

GOV. STONEMAN has appointed Mat. F. Johnson, of Sacramento, to the position of Trustee of the State Library, to fill the vacancy caused by the death of W. W. Crane.

THE Merced *Star* says: It is an assured fact that thirty miles of the Turlock and Sierra Nevada railroad will be in complete running order by the first of January, 1884.

BOWEL complaint, diphtheria, fever and other styles of sickness are among the Piutes in the vicinity of Austin, Nev., and the Inians are losing quite a number, especially children, by deatb.

A GANG of Chinamen resisted the collection of the poll tax in Josephine county, Or., Saturday, and 150 of them charged the officers and posse, who fired upon the Chinese, killing three and dangerously wounding the same number.

A MAN named Barker Ewing, on Hurricane creek, in the center of Arkansas, killed his daughter upon the announcement of her intention to marry a certain young man against his wishes. The neighbors then hanged Barker in his front door-yard.

THE FISH INDUSTRY.—Prof. Huxley, in an address at the International Fisheries Exhibition, pointed out that an acre of good fishing ground will yield more food in a week than an acre of the best land will yield in a year. Still more striking was his picture of the moving "mountain of cod," 120 to 130 feet in height, which for two months in every year moves westward past the Norwegian coast. Every square mile of this collosal column of fish contains 120,000,000, consuming every week, when on short rations, no fewer than 840,000,000 berrings. The whole catch of the Norwegian fisheries never exceeds in a year more than half a square mile of this "cod mountain," and one week's supply of herring are needed to keep that area of cod from starving.

PUNY, weak, and sickly children are made healthy and strong by using Brown's Iron Bitters.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time they intend to pay for it*, let them not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent.

Stock and Grain Land

Parties wishing to purchase good stock raising lands, unaffected by severe drouths, will do well to address the undersigned. The lands can he purchased cheap, in lots from 100 to 2,000 acres. It is partly low table and rolling land, partly clear and level. Good for vine and fruit raising. Will raise vegetables and all kinds of grain. Crops certain every year. Near town and a $10,000 public school house. Price, $3 to $5 per acre. Good local market for fruit, vegetables, grain, poultry and dairy produce. Address the proprictor,

EDWARD FRISBIE,
Anderson, Shasta Co., Cal.

Cheap Ore Pulverizer.

There is for sale in this city, by I. A. Heald, American Machine and Model Works, 111 and 113 First St, a Rutherford Pulverizer, an improved revolving barrel crusher, which was only used a few times and is as good as new. It will he sold very much below cost, and miners who are in need of such an appliance for a small mine will do well to make inquiries concerning it. It is suitable for a pulverizing mill for powder or other substances. Reference as to above can he had upon applying o thie office.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions The pavilion has new varieties of performances. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

TRUE Temperance

Is not signing a pledge or taking a solemn oath that cannot be kept, because of the non-removal of the cause—liquor. The way to make a man temperate is to kill the desire for those dreadful artificial stimulants that carry so many bright intellects to premature graves, and desolation, strife and unhappiness into so many families.

It is a fact! BROWN'S IRON BITTERS, a true non-alcoholic tonic, made in Baltimore, Md., by the Brown Chemical Company, who are old druggists and in every particular reliable, will, by removing the craving appetite of the drunkard, and by curing the nervousness, weakness, and general ill health resulting from intemperance, do more to promote temperance, in the strictest sense than any other means now known.

It is a well authenticated fact that many medicines, especially 'bitters,' are nothing but cheap whiskey vilely concocted for use in local option countries. Such is not the case with BROWN'S IRON BITTERS. It is a medicine, a cure for weakness and decay in the nervous, muscular, and digestive organs of the body, producing good, rich blood, health and strength. Try one bottle. Price $1.00.

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Extra Quality Endless Belts, Steam and Suction Hose, Air, Oil and Brewers' Hose Car Springs, Valves, Gaskets, Etc., Etc.
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UNITED STATES
Submarine Monitor
COMPANY,
230 Montgomery Street, Room 20,
SAN FRANCISCO.

WM. H MILLIKEN, Engineer.

☞ Plans are on exhibition and stock ready for sale. Any information that is desired can be furnished at the office as above.

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A Monthly Magazine.
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REMITTANCES to this office should be made by postal order or registered letter, when practicable. Cost of postal order, for $10 or less, 8 cents; for registered letter, in addition to regular postage (3 cents per half ounce), 10 cents.

Mining Companies.

Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company.

San Francisco, August 2, 1883.

At a meeting of the Board of Directors of the above named company held this day, Dividend No. 57, of twenty five cents (25c.) per share, was declared, payable MONDAY, Aug. 13, 1883, at the Farmers' Loan and Trust Company, in New York, or at the office in this city.

WILLIAM WILLIS, Secretary.

OFFICE. Room No. 29, Nevada block, No. 309 Montgomery street, San Francisco, Cal.

ASSESSMENT NOTICE.

Seaton Gold Mining Company.—Location of principal place of business, San Francisco, California; location of works, Drytown, Amador county, Cal.

NOTICE is hereby given that at a meeting of the Board of Directors, held on the 31st day of July, 1883, an assessment (No. 3) of eight cents (8c.) per share was levied upon the capital stock of this corporation, payable immediately in United States gold coin, to the Secretary at the office of the Company, Room 8, 528 California St., San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 5th day of September, 1883, will be delinquent and advertised for sale, at public auction, and unless payment is made before, will be sold on Thursday, the 27th day of September, 1883, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. A. MARTIN, Secretary.

OFFICE: Room 8, 528 California Street, San Francisco, California.

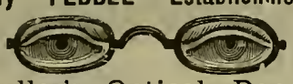
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One 20-inch bore engine, 24-inch stroke; one 18-inch bore engine, 40-inch stroke, Meyer's cut-off; one 14-inch bore engine, 36-inch stroke, Meyer's cut-off; two 12-inch bore engines, 30-inch stroke; two sets heavy pumping gear, with bob and connecting rod irons, etc.; 450 feet of 16-inch pump pipe of ¼-inch iron, heavy flanges; besides other mining and milling machinery.

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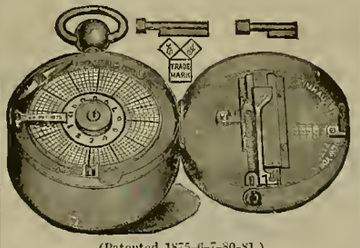
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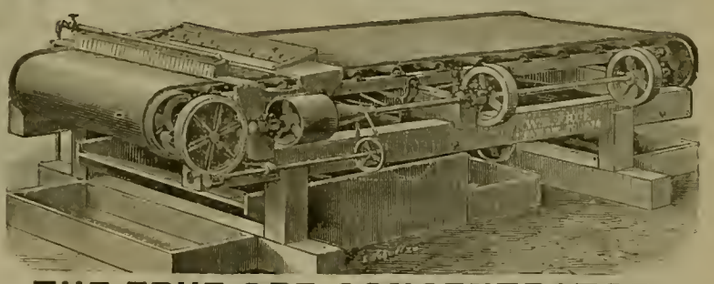
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BOUND VOLUME OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce, and valuable for future reference and library use.

$1,000 CHALLENGE!



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To those intending to manufacture or purchase the so-called "Triumph" Concentrator, we herewith state:

That legal advice has been given that *all shaking motion* applied to an *endless traveling* belt used for concentration of ores is an infringement on patents held and owned by the Frue Vanning Machine Company.

That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.

That the patent laws make *users* of infringements responsible as well as makers, and the public is therefore warned that there is considerable risk in purchasing any end-shake machine until our various patents have been decided.

That if there are those who for any reason prefer an end-shake machine, we can manufacture and sell to such a machine of that description, as efficient as the Triumph, and at a lower price, and no liability for infringement will then be incurred by the purchaser.

That we shall protect ourselves against any one making, selling or using any machine infringing any of our patents. Patented July 9, 1867; May 4, 1869; Dec. 22, 1874; Sept. 2, 1879; April 27, 1880. Patents applied for.

That we are, and have been, ready at any time, to make a competitive trial against the Triumph, or any other machine, for stakes of $1,000.

ADAMS & CARTER, Agents Frue Vanning Machine Company,

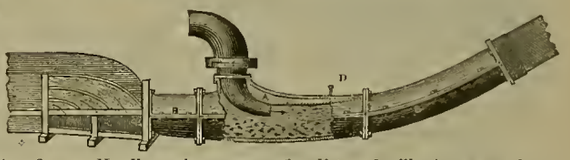
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HYDRAULIC GRAVEL ELEVATORS.

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These machines are thoroughly effective for working flat gravel mines that have no dump. Sluices gravel and water up hill on an angle of 45°, and will run any kind of gravel that will run in a flume. Handles rocks as easy as fine dirt, and will raise as much material as the water will carry off in a flume on 6 inches grade to 12 feet.

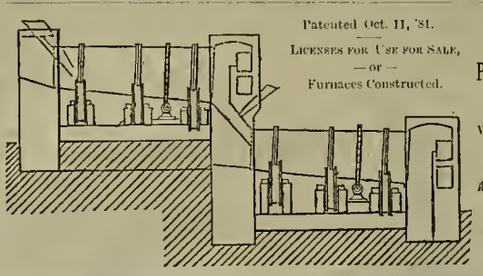
No bedrock cuts, tunnels or drains required. Machine a sufficient drain itself, and the process of mining the same as any other hydraulic mine. Is now a practical success in various places in California and Oregon.

At the property of the Yreka Creek Gold Mining Company, in Siskiyou county, Cal., an Elevator of the Improved Form has been introduced, which, with a head or pressure of water of 266 feet, is elevating through an 18-inch machine to a vertical hight of 46 feet from bedrock to upper flume.

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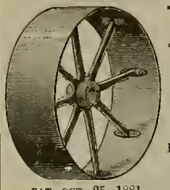
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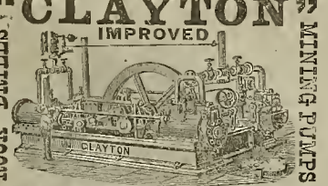
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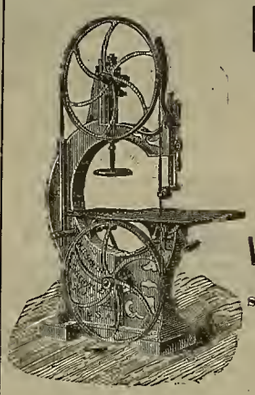
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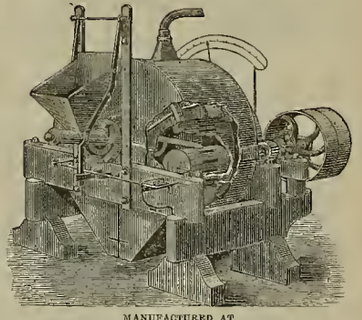
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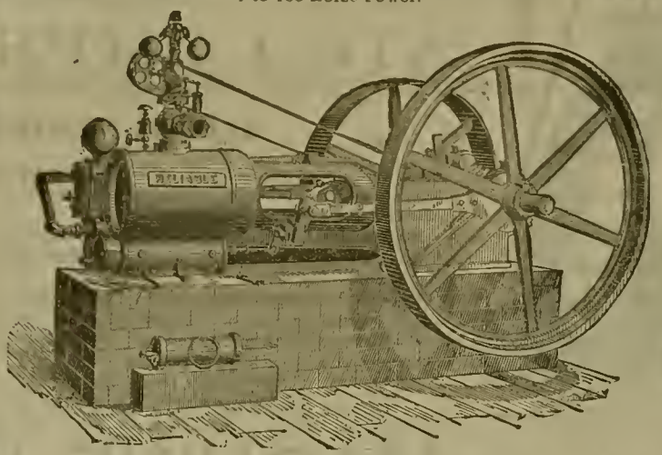
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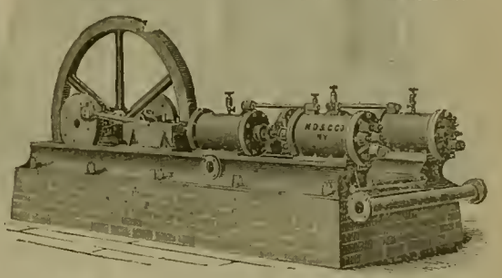
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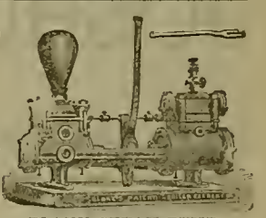


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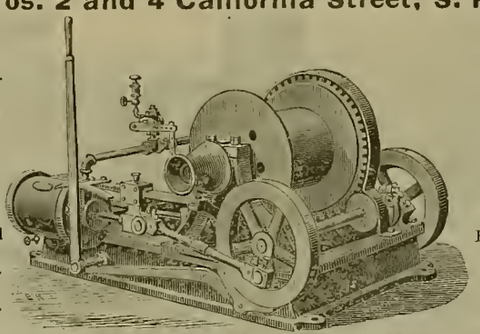


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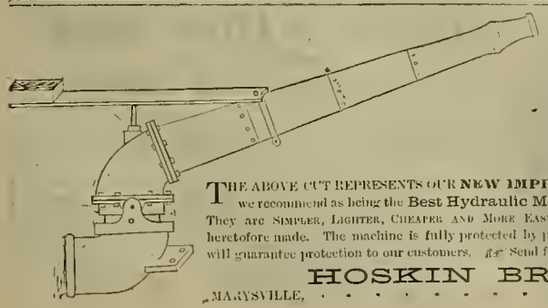
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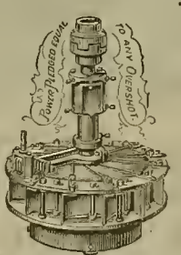
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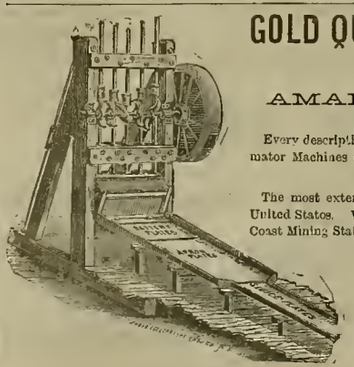
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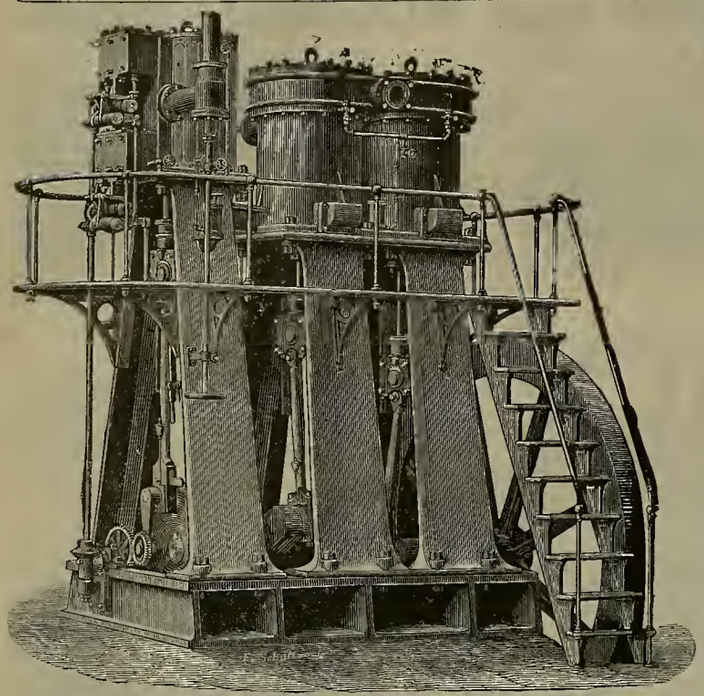
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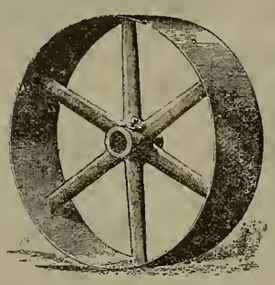
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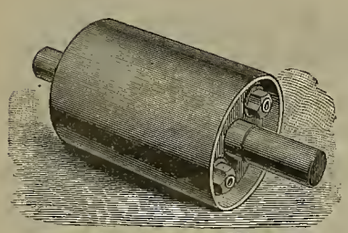
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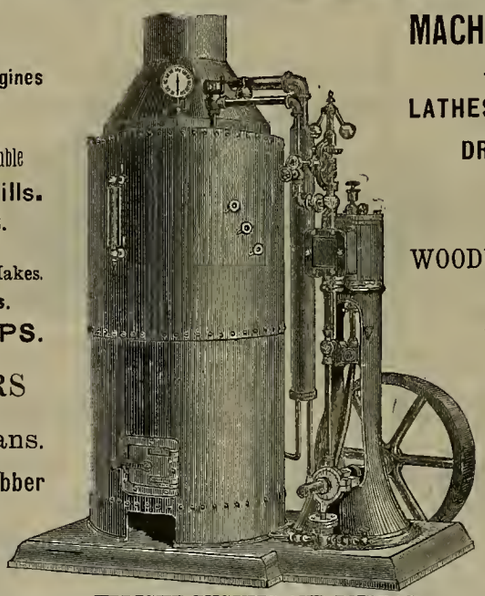
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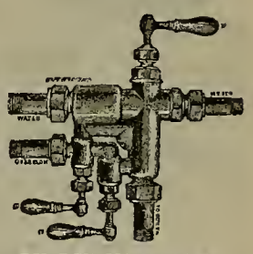
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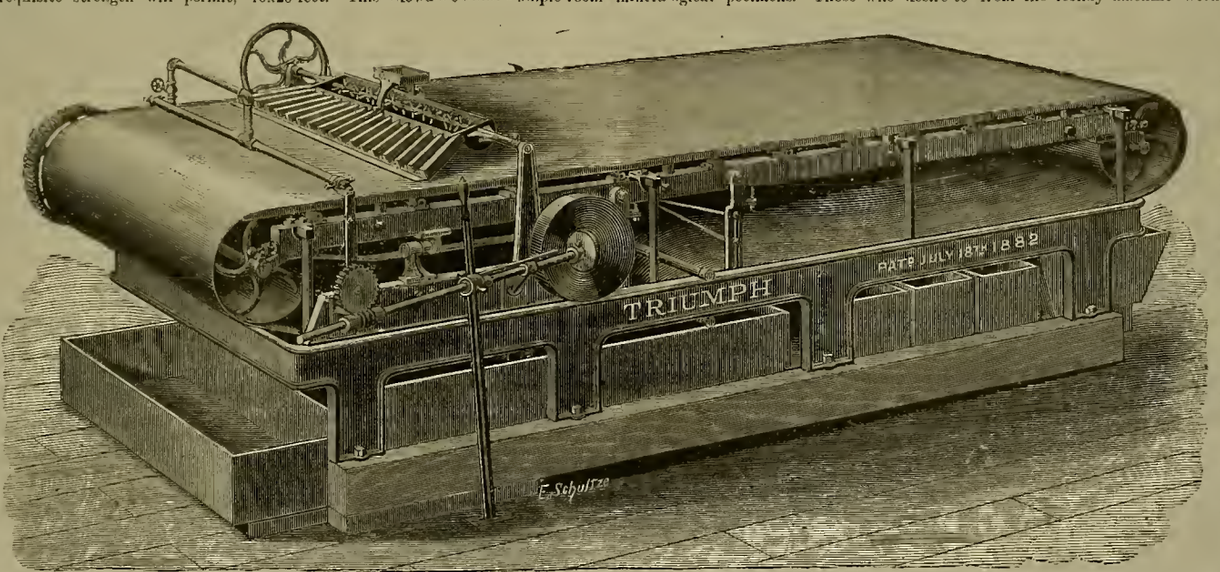
VOLUME XLVII Number 7.

The Triumph Concentrator.

The engraving on this page illustrates an endless belt concentrator invented last year, and which has been gradually improved as experience dictated. The Joshua Hendy Machine works in this city are now the manufacturers, and numerous small details have lately been perfected in the construction of the machine, all to its benefit. It is, therefore, somewhat different from what it was when exhibited at the Mechanics' Institute fair of last year, where it received the medal for the best wet concentrator on exhibition.

The advantages claimed as entering into the construction and operation of these machines are as follows;

That they are built in a superior manner; the entire frame being of iron ensures the solidity and durability of the machine, and a steadiness of movement when in operation; and being as compact as the requisite strength will permit, weigh less, require less freight space in boxes, by which the cost of transportation is decreased, and occupy less mill-room when set up.



TRIUMPH ORE CONCENTRATOR.

The endless belt is carried upon a supplementary frame, which is mounted upon peculiar springs. Its operation tends to quietly settle the sulphurets on to the surface of the belt. Once on the belt, they will travel up while the gangue discharges below. This supplemetal spring frame quietly settles the sulphurets without a too sudden jar or bump.

The reciprocating movement which is given to the supplementary frame and endless belt, in combination with a slight percussion, tends to settle and retain the sulphurets upon the belt until they are discharged at the proper moment. This peculiar motion is of the utmost importance, and enables the machine to perform a very large amount of work.

Patent self-oiling boxes have been put in for main journals and eccentrics.

The rolls supporting the belt are made of galvanized metal, which neither warp, crack nor rust—that is, the inner part is fine selected redwood, covered with zinc soldered at the ends, which practically seals up the wood so it will not warp. The feeding mechanism permits the travel of the belt to be varied at will to any desired speed.

The belts are of best quality of rubber, and durable. An improved form has been adopted. The edges are so formed that as the belt passes over the rolls at each end the edges curl up. By the new form the beveled guides on the frame are dispensed with, thus getting rid of the friction which formerly occurred.

The arrangement for saving amalgam that may escape the batteries is novel. They have a peculiar covered amalgamating box across the head of the machine with a recess for quicksilver. Back of this are riffles, as a supplemental precaution against loss. We are told this amalgamator alone (without the concentrator) has recently caught $200 a week from the pulp of a ten-stamp mill.

Three of the machines are amply sufficient to take the delivery of and thoroughly concentrate the sulphurets and metallic particles from two batteries (10 stamps), six for a 20 and twelve for a 40-stamp mill, and are conveniently set in pairs for easily adjusting and operating. Power required for running machine, two five-horse power. Water required for cleaning sulphurets, 60 gallons per hour (exclusive of battery water delivering pulp). Space occupied when set up, 10x20 feet. This allowance affords ample room between the machines and at the ends for drawing sulphurets. Weight of machine, 1,600 lbs. The heaviest part weighs 80 lbs.

The machine is now being built with a care to detail so it will practically need little attention at the mill, and so that any unskilled person can attend it. Two Triumph concentrators are used in the Gold Blossom mine, near Newcastle, Placer county, in this State, giving satisfaction. Two have also been sent to the Chicago mine at Penryn, same county. There are three on the Compromise mine, Mariposa county.

Two are being put up for the Gonzales Mining and Development company at Hornitos. The best results have been at Newcastle, where two machines are taking the pulp from 10 stamps, which are crushing twenty-five tons per day. One of these machines can be seen in operation at the Joshua Hendy Machine works, 49 and 51 Fremont street. The manufacturers state that they guarantee all purchasers as to the validity of their patents, and that they are building a practical machine that they can recommend to the mining community.

The State Mineral Exposition.

The State Mineral Exposition was formally opened at the State Mining Bureau, 212 Sutter street, on Wednesday of this week. We have before referred somewhat at length to the proposed display. In addition to the collections belonging to the State, a number of counties have contributed cases of minerals. There are also several private collections. That of J. Z. Davis is a very fine one. Owing to lack of means, Mr. Hanks has not been able to carry out his original plan fully, but he has nevertheless succeeded in getting up a very creditable display. A number of additional cases have been put in the museum, and an entire re-arrangement of the specimens has been made. The Mining Bureau will well repay a visit even from those persons not interested in minerals, for there are many rare and interesting things to see aside from the geological and mineralogical specimens. Those who desire to witness an illustration of a part of the resources of the coast can do so by calling at the Mining Bureau. We shall have more to say of the display hereafter.

At a recent visit of the agent and secretary of the Cleveland (England) Miners Association to a mine they were shown an experiment with bronze and copper stemmers. An emery-wheel was set in motion, and was made to revolve 1,200 times per minute. A new phospor bronze stemmer was pressed to the wheel for about one minute, but no sparks could be seen. A new copper stemmer was then tried; no sparks were visible, and then an old copper stemmer was applied with the same result. The miners' representatives some time ago asked the Cleveland mine owners to use phospor bronze instead of composition or copper gear for charging holes.

The big tunnel at the Ontario mine will soon be completed. It was commenced in 1881, but the progress for the first year was very slow. Its length is 5,742 feet, nearly all the way through hard rock.

Foundry Notes.

Business is rather slack at the foundries just now, though some of them have considerable work on hand.

The Risdon Iron works are at work on a large pumping outfit on the hydraulic principle which has worked so well at the Combination shaft and elsewhere.

The San Francisco Tool works are moving into their new and fine brick building adjoining their former quarters on Stevenson street. The new premises are arranged specially for these works, and are exceedingly neat and convenient.

It will be remembered that when the Cranston hydraulic elevator was first devised, many intelligent persons said it would not work. It has worked, however, very satisfactorily, not only here but abroad. Last week an eighteen-inch elevator and No. 2 water-lifter were shipped from the Hendy machine works to the Kin-Mori mines, near Gainesville, Georgia, a somewhat famous gold district. It will be used to work out some of the shallow washings before reaching up into the quartz above, which is hydrauliced. They have some 300 acres which they are going to work by the elevator.

Some considerable correspondence was carried on with Col. Latham Anderson, of Anderson & Hobby, mining engineers of Cincinnati, in reference to the elevator, and finally he concluded to come to California and see the machine at work. After arriving in San Francisco he went up to Cherokee, where there is one of the most improved form, and the best ever built, at work. He was so much pleased with what he saw of its operation that he gave the order referred to.

The manufacturers are also in correspondence with a gentleman in New York relative to making one of these gravel elevators for use in North Carolina. This is another instance of the utilization of California machinery by other communities.

At the Whitehaven collieries, England, where they have been mining since 1667, they have a pumping engine which has been at work since 1806. It is one of Newcomen's atmospherics, and is constantly in use, and still in first rate order, after working about seventy-nine years, being about the only one of the class extant.

The Calico *Print* says about thirty tons were taken out lately from the Blackfoot mine, which is reported to go $4,000 to the ton.

The Carson Footprints.

The following paper on the Carson footprints was read before the California Academy of Sciences at the meeting last Monday evening, August 6th:

One year since I read before this Academy a paper relating to the now famous footprints at Carson. The motive which has induced me to prepare another paper upon the some subject is, that I may be able to explain more in detail many facts—then simply referred to—which are now likely to become of the most importance in determining the many vexing questions which are constantly arising in relation to these interesting remains. A desire to render myself clear must serve as my excuse for the repetition of a few extracts from my former paper.

Within the past year the quarrymen have laid bare a number of new tracks and a few fragments of the bones of animals. These recently discovered footmarks were all upon the lower level of the quarry, and are all of the same character as those which had previously been exposed. Of fossils there have been found during the past year a portion of the jaw of an animal not yet fully identified, a tooth of the horse and many fragments of the bones of animals. These bones have been carefully preserved, and it is to be hoped that they may be of value in the future, when a careful study shall be made of them. While these bones may prove of very great interest, yet they attract but slight attention when compared with the foorprints which are found upon the floor of the quarry beneath them. These prints continue to excite the liveliest interest not only among the scientists of America and Europe, but also amongst the people at large.

Of Bipedal Origin.

While some express the belief that the tracks are those of a quadruped—Prof. Marsh, even before so august a body as the National Academy, ventures to give name to the animal who made them—there are others, including the writer, who are equally sanguine in the belief that the footprints in dispute are of bipedal origin.

The question is gradually being brought within narrower limits, and it is likely that in the future the principal point for discussion will be, whether the tracks are those of a quadruped or those of a man, as it would appear that if it were once satisfactorily determined that they are surely the imprints of a biped, it will prove but an easy task to show conclusively that they were made by the progenitors of the human race.

I am fully aware that there are likely to be many delicate points which must yet be adjusted before the scientist will give full credence to so momentous a conclusion.

It is of importance that the exact geological period should be determined, so that other remains of man of that period—if any such should exist—such as flints or other implements, may be grouped together, and their relations, the one with the other, definitely determined. When this work shall have been completed, we may be sure that the Nevada man will take the position to which he is entitled.

Foot-Pads or Cushions.

All animals which walk upon the earth's surface are provided with certain pads or cushions which serve the double purpose of protecting the foot while in contact with the earth, and also by their elasticity facilitating motion. These pads or cushions vary greatly in form and density in the different animals so as to meet the requirements of the individual to which they may belong, so that these pads may often serve as important aids in the determination of species.

If, by way of illustration, we examine the foot of the ordinary barn-yard fowl, it will be seen that the bones are protected by these pads, and this is especially the ease where any articulation is in the least exposed to pressure.

Among the higher animals we find essentially the same conditions existing; in some instances the cusion is modified (as in the frog of the horse) so as to meet its requirements.

With the dog these pads are of such elasticity as to greatly facilitate his movement when running, while in the elephant locomotion is only possible owing to the heavy pads which protect the bones of his foot from harm. In man these pads are conspicuous wherever there is an exposed articulatian, and they are found to be of uncommon prominence and density amongst savage tribes who don't protect the foot.

In the investigation of the subject before the Academy this evening, where so much depends upon correctly interpreting the imprint of the foot upon the surface of the earth, we are compelled to note every minute trace which can be of service to us in our work; hence it will be seen that it is of the utmost importance that we not only make note of the shape and general outline, but that we also note every indication of the presence of any protection to the foot, be it either natural or artificial.

For this reason I have brought forward evidence to show that the pad is a necessity to all animals who walk upon the earth, and that their impression being absent in any footprint may well excite suspicion that the foot was artificially masked. Upon a close examination of the many tracks of birds at the prison, not only is the distinct form of the footprint preserved, but also the imprint of the pad as well.

Comparison with Other Tracks.

The impression of the foot of the dog is also most clearly defined, not only showing the pads and toes, but the imprint of the toe nail may also be distingisbed.

The track of the deer is as clearly defined and as sharply cut as though it were made but yesterday, even showing that one of his toes had been worn away so as to become shorter than its fellow, which is a deformity very common amongst mature individuals of the deer family of the present period.

On examining the impressions made by the elephant, we find that those of his tracks which have not been disturbed are clear and distinct, while certain irregularities in outline furnish proof, if proof were needed, that the impressions are those of a quadruped.

Description of the Track.

I now call your attention to far the most important prints to be found in that locality, viz: the tracks made, as the writer believes, *Homo Neradensis*.

These are about 400 in number, and belong to seven or eight distinct series, made, apparently, by as many different individuals. In length these prints are from fourteen to twenty inches, with a breadth of eight. The length of step is from three feet two to three feet three inches. The width of trackway (straddle) is eighteen inches, while the step is no longer than that of a man of the average stature. Here, it must be admitted, the trackway is of abnormal width. Of this, however, I shall speak presently.

As stated in my previous paper, in outline these impressions follow closely the shape of the human foot. From the toe outward the line is gradually drawn in toward the heel, while from the toe inward there is a graceful curve to the instep, and from thence in an outward direction to the heel. In one series of tracks this curve is much sharper than in any of the others. After repeated and careful observation I have failed to discover in any one of the 400 tracks the slightest indication of the imprint of pad or toe, of instep, of claw or of heel.

The absence of such marks becomes the more significant when we take into consideration the fact they are surrounded and actually crossed by tracks of other animals, which are so easily identified by their tracks alone.

Evidence of Sandals.

In each one of the footprints we find evidence, as I believe, that the foot had been protected by some artificial means; in some cases this was made of wood, as it would seem, or some other material equally unyielding, as the imprint is that of a plane.

In one or two of the series a depression along the central line of the track would indicate that in this case the individual had used a material more yielding than wood, such as the dried skin of an animal, which, becoming moistened, was bent upward at the sides.

The line of prints designated in Mr. Gibbs' plan of the locality as No. 1, is by far the most important of any which have as yet been discovered. It is here that we find impressions which are the most distinct. When I first visited the locality I obtained casts in plaster of several of those, which were subsequently engraved, and accompanied my first report. In order to render myself clear, I take the liberty to briefly refer to these diagrams:

In diagram No. 1, which is that of a left foot, we find that but a part of the impression made by the sole of the sandal is to be observed, which is included in a line of the average breadth of an inch or more, extending along the inner side of the foot, from a point near the heel to the toe; the toe of the sandal being shown for a distance of two inches from its extremity. In diagram No. 2, a right foot, the toe is still more distinctly shown, with indications of pressure upon the inside of the foot near the heel. In diagram No. 3 we not only find the toe of the sandal well shown, but a line indicating the pressure of the sandal from the toe backward nearly to the heel, this line being traced upon the outer side of the foot. Diagram No. 4 represents the imprint of the toe, and a line from the toe along the inside of the foot to a point near the heel.

As will be seen by these diagrams, the sandal was eight inches in width. We can easily imagine that the use of such unwieldly foot gear, especially when walking in muddy ground, would serve to account for the great width of trackway. Briefly reviewing the subject, there are many reasons which have led me to the conclusion that these

Imprints are not of Quadrupedal Origin.

Among the most important of the objections is: First—The entire absence of such destinctive marks as would indicate an unprotected foot. Secondly—There are no indications of a misstep, either by accident or at points where the animal has deviated from the straight line. Professor Marsh's statement that he is assured that a double trackway has been found, is certainly news to those who—unlike himself—have personally examined the tracks as they now appear upon the floor of the quarry. Third—The curve of the foot is so regular and so constant to show that in every instance the hind foot—if of a quadruped—was at all times placed exactly upon the spot previously occupied by the forward foot, or that both the forward and the hind feet were of exactly the same form—conditions which, to say the least, are extremely improbable. Fourth—We find, as before stated, that in one or two of the series (especially in that of N. 3 of Mr. Gibbs' plan) the central portion of the impression in the line of its long diameter, is somewhat more depressed than at the border, which is doubtless owing to the sole of the sandal having, when moistened by contact with the mud, yielded slightly to the pressure. This, as an isolated fact, becomes of great import, as it would indicate that if the tracks were of a quadruped, they were surely made by animals of different species. And finally, upon carefully studying the impressions upon the ground, we find that the angle of the foot varies in the several series, in some the curve being much sharper than in others; and while this fact may be easily accounted for upon the supposition that the form of the foot-gear varied according to the taste or the caprice of the wearer, yet it will doubtless prove to be a work of considerable difficulty to make this fact harmonize with the quadrupedal theory.

Lava Beds Mines.

Brief Description of the Principal Mines.

The reports that are constantly coming in from this new district, says the Calico *Print*, are very favorable, and convey the impression that the mines there are looking exceedingly well, and that there will be a large influx of miners and parties engaged in other branches of business to this new El Dorado as soon as the weather becomes cooler.

The principal developments in the district are being accomplished by the Morning Star mining company, consisting of Messrs. G. W. Grayson, of Oakland, J. H. Roberts and John McNally, of San Francisco. A few rods of openings have been made in one of their claims, the Meteor, but the company have concentrated their operations for the present on the Morning Star, which is beginning to twinkle with a bright and silvery luster in the midst of a constantly increasing galaxy of rich mines that will, in the course of time, place San Bernardino county at the head of the most prominent mineral-producing counties on the Pacific coast. There are twenty men at work in and about the Morning Star mine. The ledge on which this mine, also the Meteor, Mammoth, Chief, Sampson, and most of the principal locations of the districts are situated, runs in a northwesterly and southeasterly direction, the Meteor joining the Morning Star on the northwest. In a ravine at the southest end of this last mentioned mine is the camp of the company. Four or five hundred feet above the camp, near the croppings of the ledge, a blacksmith shop has been built. Several rods below it is a tunnel driven in about seventy feet in a northwesterly direction along the ledge, and connects with a winze sunk in the upper end of a thirty-foot cut, the winze being seventy feet deep. A track is laid in the tunnel over which the car carries the ore and waste rock to the respective dumps. A few rods northeast of the blacksmith shop is another cut about twenty feet in length, and about the same distance from the shop in a northerly direction is a shaft sunk about fifteen feet. Ore of a high grade has been taken out from all these openings. There are now twenty-five tons of ore on the dump that will average $200 a ton. A sack of average ore was sent to San Francisco as a sample that realized in silver eighty-five per cent of the assay test. The company feel encouraged that they have two valuable mines, and a few months' energetic operations will determine whether they have or not. It is the intention of this company to build a mill near the well in the dry lake as soon as they are satisfied they have permanent, paying mines. Judging from present developments, it will be a safe and remunerative investment to erect a mill there in a few months.

Last Wednesday when the foreman, Mr. John McNally, arrived at Daggett station he paid the remaining $10,000 due the Clark Bros. on the Morning Star and Meteor mines. The Clark Bros. are worthy of the snug little fortune they have realized from the sale of these mines. They still have some excellent mining property left.

As soon as the weather is cooler work will be commenced on the Sampson claim, recently bonded to Abe Bateman by S. P. Blade. For valuable services gratuitously rendered in prospecting this claim by James Parker, Mr. Bateman presented him with a gold watchand chain, and it is reported he will also be appointed foreman of the mine.

Mr. S. H. Baker sold his interest in the well located in the dry lake, and also his interest in the freigbting business to Messrs. E. A. McDuffee and J. S. Weaver, of Calico. The company, which now consists of these two gentlemen and Mr. Dan Guerne, are making arrangements to increase their facilities for hauling water and freight. Mr. McDuffee bought a span of fine horses from Mr. Van Briesen, of Daggett, to use in the business. In a few weeks they will have two four-horse teams engaged in hauling water to the mines and freight from the depot.

McDuffee & Weaver are erecting a building for a general merchandise store, and in a few days Mr. Weaver will go to San Francisco and lay in a large stock of goods. Mr. McDuffee will remove his tinshop into this building also, which will be in charge of Frank Lanyon.

Mr. Floyd, who resides eight miles from Los Angeles, owns a controlling interest in the Lizzie mine and intends to begin operations in a few weeks. Messrs. S. H. Baker and Dan Guerne each own an eighth interest in this mine. A tunnel has been run in fifty feet, from which sufficient ore has been taken out to justify them in opening up the mine in good shape.

Quite a number of prospectors have arrived in the district within the last few weeks.

Mines of San Diego County.

We have received from Mr. H. C. Burchard, Director of the Mint, advance sheets of his forthcoming report for 1882, relating to the production of the precious metals in California. We give the following extracts relating to the mines of San Diego county:

San Diego is the extreme southern county in the State of California, bordering on Lower California. The mining is done chiefly in the Julian, Pinacarte, Cargo Muchacho and Banner districts.

The Julian district, ten years ago, attracted attention far and wide. These mines have passed into the hands of Eastern capitalists, and, encountering a few discouragements, such as are incident to all mining ventures, have been allowed to languish; but recently new parties (old miners of experience) have taken hold of the mines, and they are being developed. The prospects are very flattering for obtaining good, productive property.

The San Jacinto mill, in the Pinacarte district, after a partial run of ten days, cleaned up $1,200. The mill is now doing good work, and crushing from twelve to fourteen tons per day. From the present outlook of the mine, it is anticipated that the mill will be turning out a large amount of bullion soon.

The Yuma Mill and Mining Co., at El Rio, is in a prosperous condition. The mill is steadily at work, and turning out a large quantity of bullion.

The Ready Relief mine and mill at Julian is in a prosperous condition at present. The yield of precious metals for the last six months has been largely in excess of any former period. The mine is looking promising.

The development of the Shenandoah mine, this side of Julian, has been pushed since Mr. Burchard's report was compiled. The indications in this mine are of the most flattering character, several thousand dollars worth of bullion having already been produced.

At Pinacarte the mines are all doing well; the poorest quartz and quartzite run from $30 to $40 per ton in gold. Three mills are crushing the quartz, one of them being a custom mill, which is of the greatest advantage to prospectors who own rich claims without the capital necessary to erect a mill. The California Southern railroad trains run within half a mile of the mines and mills. From all reliable information that can be gathered, Pinacarte is destined to become one of the richest mining districts in southern California.

Cargo Muchacho District.

This district was organized as early as 1862 as a mining district. The principal mine in this district is the Madre mine, which is a full claim of 1,500 feet, situated about three and a half miles from Ogilby station, on the Southern Pacific railroad. It lies in granite mountains, through which runs a reef or dike of talcose slate, the strike or direction of which is north, one degree east, and is about 200 feet wide, having a casing of slate on the west as a wall and of granite on the east. It is in the talcose dike that the Cargo Muchacho ledges are found. The claim covers three ledges. The one upon which the first shaft was sunk is the extreme west ledge. No. 2 is 170 feet deep, and levels have been run from the 50, 100 and 170-foot stations. The width of this ledge varies from one to five feet. From the foot of shaft B a crosscut was run east thirty-one feet into ledge No. 2. This ledge is parallel with the first, but is larger, and is the one upon which most of the work has been done. From where the crosscut struck the ledge a drift was started north along the vein, showing a body of ore averaging five feet in width. The drift was run 225 feet. This opens an ore-body 200 feet long and 200 feet high, which is the only supply of any quantity opened. The shaft has been carried down about 100 feet further, showing ore and a ledge at the bottom of eight feet in width, some stoping having been done on each side of the shaft.

The Madre and Padre mines are located parallel to each other, side by side. They are so similar to each other that a description of one will answer for both. They are also situated in a talcose dike, having an east wall of slate. The west wall is not well defined on the surface, but is supposed to be about one-half mile west of the Madre mine. They lie about one mile west of the Cargo Muchacho mine.

All the mines mentioned have good roads leading from them to the railroad station, over which ten mules of average size can haul two tons per trip, and make two trips per day. The absolute cost of hauling the ore from the mines to the station is forty-two cents per ton. The cost of mining and milling is very low. There is no water to contend with in the mines, timbering is slight and cheap, and wood is plenty at three dollars per cord. This is for four feet mesquite wood, which is equal to the best oak.

With a mill erected at the Cargo Muchacho mine, ore that will pay five dollars per ton can be worked at a fair profit, and there are several thousand tons stored in the mines now that will pay that much. The only reason for not putting the mill on the mines in the first place instead of on the river, was that water would have to be carried about seven miles from the river to the mines. This, however, can easily be done at a cost not exceeding $17,000. With a mill on the Cargo Muchacho mine, ore can be mined and milled at a cost not exceeding three dollars and twenty-five cents per ton.

MECHANICAL PROGRESS.

Steel Hardening.

Every one who has had any practice with steel hardening will have observed that articles so treated seldom remain exactly the same as they were before hardening. The experiments which for this reason have been made by different persons show that steel increases in size through the hardening; and if this fact be kept in mind, we have a clew to the deformations visible in certain classes of work; simultaneously we know what to do to avoid them. The first condition is, that steel should be of one uniform texture, for the better the quality the harder it will become; or, vice versa, the harder it becomes the more valued it is; and the harder it is made, the more will it increase in volume. Now, if a piece of steel is softer on the one side than on the other, the hardest side will expand more, and, as a consequence, this side will be convex, while the soft side will hollow, or be concave. This is plainly visible if steel be welded on iron, and the whole then hardened. To counteract the evils that we have just alluded to, various means have been devised.

Hardening in oil and fat has the advantage that steel intended for tool purposes requires excessive heating, whereby the texture of the material is deteriorated; for the more steel is heated before cooling, the more is its fibrous nature transformed into a crystallized state. If only fresh water of ordinary atmospheric temperature be used, and the steel merely heated to a cherry-red heat, a degree of hardness may be obtained which will be found sufficient for every purpose. In order to protect steel from losing its carbon, it is well to coat the articles to be hardened with a coating of train oil and soap, over which powdered horn-chips are strewn. Small articles may be covered with train oil and soap boiled together to a stiff paste, and subsequently placing them on a sheet of iron; they are next covered with powdered horn-chips. After being placed in the fire until no flame is visible from the horn-chips, they are next briskly immersed in water. The quicker the entire articles are thus immersed, the less will they become distorted, no matter whether the wide or the narrow side is first immersed. In place of using horn-chips by themselves, a mixture of horn-chips with a third of kitchen salt may be used. The latter gives a lighter color, whereas the soap in the forementioned mixture renders the articles handsomely white. When the hardened articles are cleaned lightly they are (whereby corrosion must be excluded) smeared with oil, and are allowed to oxidize according to the material to be worked therewith; *i. e.*, to a yellow cast for steel and to a brown color for brass; they are, however, not to be cooled any more in water, but slowly by the air. They thus receive greater elasticity. Articles which have become distorted under the hardening process may be again straightened during tempering by spanning them in a vise on to a somewhat concave piece of iron, and heating them afresh. When these articles become yellow, the vise is screwed up till the articles are straight, after it is cooled in such a manner that the convex side is first immersed in water. Small iron articles may be similarly hardened to small steel articles by first smearing them with the train oil and soap, and next placing them on a sheet of iron, strewing them over with a red or yellow prussiate of potash, instead of horn-chips. The articles become very hard, and feel rather greasy when they are taken out of the water.—*Mechanical Engineering.*

Utilizing Slag Waste.

Under this head an English paper states that there are now machines in operation in Great Britain that will turn out from 10,000 to 12,000 slag bricks per day. These bricks are described as being strong, perfectly uniform in size and requiring less mortar than ordinary bricks. The molten slag is run into molds direct from furnaces ranged round a rotary table, or by grinding the material and mixing it with sand, and then pressing. Both bricks and slabs are found well adapted for railway platforms, buildings of all kinds, baths, drainage pipes and roads, being more durable than ordinary stone. Besides dwelling upon the utilization of blast-furnace slag in the form of the well-known mineral wool, now so extensively used, the paper in question says that there appears to be no reason why slag should not be utilized for ornamental purposes, seeing that it is produced in nearly all colors, and the cost would be trifling. Slags from hematite ore, containing a certain proportion of manganese, give the tint of the amethyst in the vitreous parts, but by certain means that color is made to disappear and is replaced by a pearly white pumice one. Under different conditions the same furnaces give a slag of a dark green color. There are nearly all shades of blue and green, and there are light greens as well. An opalescent slag is usually found where there is a considerable quantity of alumina in the ore, while the ores of the coal measures give an alternation of shades, with dark green or blue stripes, sometimes running into one another, while an excess of lime gives a slag of a dull stony character. With protoxide of manganese, found in considerable quantities in spathic ores, in some instances to the extent of from 8 to 10 per cent, a violent color is produced, and yellow or dark green by proto-sulphide of manganese. A bright blue is met with in the Swedish slags, and looks well, and is attributed to various matters in the ores, probably sulphide of manganese. The colors of the slag, however, vary with their composition and the conditions under which the furnaces are worked, but the slags produced from furnaces with light burdens and making gray iron are usually white or gray. Where the burden, however, is heavy, and the temperature not so high, they are usually black, their vitreous character and fluidity increasing in proportion to the amount of silica in the ore. There is no difficulty found in getting the slag into a fluid state and casting it in molds. At present, however, the utilization of the slag, or blast furnace refuse, as it is generally termed, is principally confined to the making of bricks, slabs, slag sand, shingle for concrete, paving blocks, mortar, glass bottles, and the fine slag wool, or silicate cotton, for which there is now a large demand.

THE FIRST AMERICAN STEEL RAILS.—The first steel rails rolled in America were manufactured—not in Chicago, as commonly believed—but at the Wyandotte Rolling Mill, at Wyandotte, Mich., on May, 11, 1865. On May 24, 1865, steel rails were rolled at the North Chicago Rolling Mill, in Chicago, and as this was accomplished in the presence of a large number of members of the American Iron and Steel Association, which society then had a meeting at the Tremont hotel, in that city, that date and place became better known among iron and steel manufacturers. Several steel rails and an assortment of other shapes, plates, bars, etc., of the same material, bent and treated in the various ways to show its ductility, strength and homogeneity, were on exhibition in the vestibule of said hotel during the session of the society, and attracted great attention. The ingots for those rails, etc., were made at Wyandotte, Mich., by Ignatius Hahn, of Pittsburgh, who was there as superintendent of the Bessemer steel works, on May 4, 1865; produced at once serviceable ingots the second day thereafter (May 6th); got ingots heated, hammered and rolled out to rails of sixty pounds weight per yard, under his directions at the Wyandotte Rolling Mill on May 11th, and subsequently also at the North Chicago works on May 24 and 25, 1865.

METALLIC CLOTH. This novel invention, which has already been noted in these columns, is about to be commercially utilized on a considerable scale. This cloth, if desired, can be impressed with a pattern or printed upon. In the manufacture of this curious fabric the metal intended to be used is rendered into small particles, short or long, according to requirements, and in this form is mixed with a sticky material, such as india rubber. The mixture, as thus prepared, is transferred to goods made from cotton, wool, linen, silk or other textile, after which the fabric is dried and calendered, or dressed, in a suitable manner, so as to produce a smooth, metallic face. The process having thus been carried on to this extent, the cloth can be impressed with a desired pattern by the simple operation of embossing, or the pattern may be printed on its surface in the usual manner. The liquid charged with the metal does not penetrate to the under side, but leaves it quite clean. The finished material is quite soft to the touch and perfectly pliable.

MAGNETIC TOOL IN MECHANICAL INDUSTRY.—The method or principle by which a hollow coil of wire, or solenoid, sustains a heavy weight of soft iron in its center, provided a current of electricity is passing through the coil, and the current being cut off, the iron mass of coarse immediately dropping, has been carefully investigated of late by a French electrician, the result being the production of a hammer, possessing, it is said, some particular advantages. The tool consists of a solenoid about 3.28 feet long, composed of a series of flat coils placed one upon the other, forming a hollow cylinder, within which a second cylinder of soft iron, weighing about 55 pounds, is free to move. There are 80 of these flat coils, and these are connected with a battery in such a manner that a simple turn of a handle will direct the current into the solenoid, and the inclosed soft iron core may be correspondingly raised. The mechanism is so complete, it is said, that the blows of the hammer can be regulated to a nicety.

IMPERFECT DYNAMOS.—*Mechanics* says: Some mechanical engineers who have recently been investigating the operations of the electric light companies with a view to the introduction of electric light plants, have made most unfavorable criticisms upon the mechanical construction of some of the electric light machinery at present turned out. Their complaint is, that it is rough, carelessly made and poorly fitted, and that before a high efficiency can be attained by certain companies their methods of construction must be entirely remodeled, and the work done on the dynamos be as fine and accurate, to say the least, as that to be found on engines which are to run at a similar rate of speed.

USEFUL RULE.—Multiply the length of a sheet of boiler iron by .31831, and we have the diameter it will roll up to. This is convenient for boiler makers who, having a sheet of given length, wish to know what size cylinder it will make. No allowance is made in the above for lap. Observe the decimal point; that is, point off five figures on the right; the remainder is the diameter of the circle.

SCIENTIFIC PROGRESS.

Flowers and Insects.

In these days, after the very elaborate and ingenious demonstrations of the relations of flowers and insects, it is scarcely any longer doubted that the intimate economy of both has been modified and adapted directly with reference to the needs and habits of each; that the flowers have developed color, scent, and intricate devices of form to attract and to entrap the insects, in order that by their propitious visits they may be cross-fertilized, improved and more widely distributed; that on the other hand, the insects have become modified in shape and instincts to adapt themselves more commodiously to the various flowers, a process that has secured in nature a great variety of forms and habits among insects, and that these introactive influences are ceaselessly active.

Naturalists are inclined to think that the evolution of flowers, by which we now find three ways of fertilization created, viz: self-fertilization, wind fertilization (anemophily), insect fertilization (eutomophily), has followed exactly this last-mentioned order. That in earlier ages plants were all self-fertilized; that wind fertilized plants mark the next steps in advance, perhaps, and that insect fertilized plants developed their beauty of color and form last of all in the struggle for existence.

At this point Mr. Ed. Heckel, a French botanist, enters a protest, contending that colors of flowers have not been evolved with any reference to the perceptions of insects. And he instances the brilliancy of the Alpine flowers, where he maintains there are no insects, or too few to affect the results claimed by the evolutionists.

But recently M. Ch. Musset has spent four years of close observation in these altitudes, and affirms that insects are not absent or even rare at elevations of 7,000 feet above the level of the sea, and that the flower visitors, the Lepidoptera, Hymenoptera and Diptera, were more numerous than the other orders. Further, the *comparative* rarity of insects at high elevations is exactly calculated to produce a sharper competition among the flowers, and lead to the production of more brilliant and conspicuous tints. M. Heckel still insists upon the insufficiency of the cause assigned, and, of course, he may be right, but the presumption is against him at present. His own explanation seems at any rate deficient, being that "the solar radiations are more intense than in the plains."

This might, it seems natural to think, affect the colors of the insects as well as those of the flowers, but they are as a rule somber and dark. At any rate, the brilliant skies of Persia, Arabia and the Sahara have not produced a brilliant flora and fauna.—*Scientific American.*

A New Kind of Gunpowder.

Himly, in his efforts to discover a new kind of gunpowder that should possess more power than the ordinary powder, without the dangerous properties of the nitro-compounds like dynamite and that class, found that the best results were obtained with a mixture of saltpeter, chlorate of potash, and a solid hydro-carbon.

The new powder is made by mixing finely pulverized saltpeter, chlorate of potash, and coal-tar pitch with enough benzol (from coal tar) to make a plastic paste or dough. This is formed into flat cakes by pressing it into molds and the benzol allowed to evaporate. The cakes are then granulated like any other gunpowder. Like ordinary powder the grains are irregular, and can be made of any desired size. Its specific gravity is 0.9, or a little more, agreeing with common gunpowder.

It is quite hard, and does not smut off even when damp. It will bear a heat greater than that of melting tin without change. It will not ignite by a single spark of short duration. If ignited in an open vessel, it burns rapidly with a white light. In a closed space it burns violently, and leaves behind a slight residue, producing but little smoke. A gun is not injured in the least by the products of its combustion.

The advantages of this powder over those previously in use are essentially the following:

1. Ease and rapidity of manufacture.
2. There is no danger in making it.
3. Its freedom from any hygroscopic qualities; 100 grammes of it exposed to damp weather for four days in an open window showed no gain of weight with a delicate balance.
4. It is two and a half times more powerful than common powder.
5. The slight residue, leaving scarcely any thing.
6. The fact that it gives off so little smoke as to be scarcely noticed, and what is formed is totally innocuous as contrasted with that from nitro-explosives.—*Repert. Analyt. Chemie.*

PHOTOGRAPHIC POSITIVES PRODUCED DIRECTLY ON PAPER.—Cros. Vergeraud has utilized the properties of bichromates to produce positives directly on paper. He first saturates a suitable kind of paper with a solution of 2 parts of bichromate of ammonia and 15 of glucose in 100 parts of water, dries it, and exposes it under any positive (either a glass transparency, a drawing, tracing or other flat object). As soon as the exposed parts turn gray, it is immersed in a bath consisting of one part of nitrate of silver and 10 of acetic acid in 100 parts of water. The picture makes its appearance at once, and is of a blood red color (bichromate of silver). Wherever the light acts upon it, the glucose reduces the bichromate, but in those places which have been protected by the drawing, etc., the bichromate will be unchanged, and hence capable of forming chromate of silver, which is insoluble in water. If dried by the fire, the picture will remain red; but if exposed to the sunlight, it becomes dark brown. Sulphureted hydrogen, or a bath of potash and copper turns it black. *Comptes Rendus.*

A DIFFUSION ENGINE.—A curiosity in physics was exhibited by Mr. Woodward lately, at the Physical Society, London, in the shape of what is veritably a diffusion engine, that is to say, a machine in which work is done by the diffusion of gases. The action of the engine is based on an experiment of the late Professor Graham, the well known chemist. The experiment consists in taking a red clay porous cylinder containing air, and covering it with an inverted bell jar full of hydrogen. The hydrogen diffuses into the cylinder more quickly than the air diffuses out, as shown by means of a glass tube projecting from the bottom of the cylinder into a vessel of colored water. When the gaseous pressure inside the cylinder is increased by the influx of hydrogen, the mixed gases descend this tube and bubble out of the water. On removing the bell jar, the action ceases and a reaction, due to fall of pressure, causes the water to rise in the tube. By suspending the gaseous cylinder of porous clay from a balance beam, and directing a jet of hydrogen gas against its side, the beam begins to oscillate, and keeps plainly oscillating for a length of time; the action being sustained, as Prof. W. G. Adams, F. R. S., pointed out, by the alternations of gaseous pressure in the cylinder.

SENSE OF DIRECTION IN ANIMALS.—The remarkable faculty which cats, dogs, pigeons and other animals possess, of returning in a straight line to a point of departure, has awakened much curiosity on the part of naturalists. Some refer it to instinct, some to intelligence similar to that of man, some to an internal mechanism which makes the animals simply automata; but none of these attempted explanations does anything toward solving the mystery. Wallace supposes that when an animal is carried to a great distance in a basket, its flight makes it very attentive to the different odors which it encounters upon the way, and that the return of these odors, in inverse order, furnishes the needful guide. Toussenel supposes that birds recognize the north as the cold quarter, the south as the warm, the east (in France) as the dry, and the west as the moist. Recently Viguier has published, in the *Revue Philosophique*, an original memoir upon the sense of orientation and its organs, in which he attributes the faculty to a perception of magnetic currents.

INFLUENCE OF ELECTRICITY ON VEGETATION. Mr. Maeagno (*vide Les Mondes*) has experimented near Palermo upon the influence of atmospheric electricity on the growth of grape vines. Sixteen plants were submitted to the action of an electric current, by means of a copper wire inserted by a platinum point in the extremity of a fruit-bearing branch, while another wire connected the branch at its origin with the soil. The experiment lasted from April to September. The wood of the branches which were experimented upon was found to contain less potash and other mineral matters than the rest of the vine, but the leaves had an excess of potash in the form of bitartrate. The grapes collected from the electrized branches furnished more mast, contained more glucose, and were less acid.

EGYPT'S SCATTERED OBELISKS. Thirty obelisks transported from Egypt from time to time are now standing in various parts of Europe. Of these there are in Rome eleven, of which four are higher than the New York obelisk. The highest of these, and the highest in Europe, being 106 feet without the base, stands before the church of St. John Lateran. The obelisk in the piazza of St. Peter's is 82 feet 9 inches high. Both of these are mounted on high pedestals. The pedestal of the St. John Lateran obelisk is 44 feet high, making the entire height of obelisk and pedestal 150 feet. The pedestal of the St. Peter's obelisk is a trifle less than 50 feet high, making the whole height of the monument 132 feet 2 inches.

NICKEL CRUCIBLES.—M. Mermet recommends nickel crucibles instead of silver ones for use in chemical manipulations. Nickel is slightly attacked by melted potash, and so is silver itself. Nickel crucibles cost at first much less than those made of silver, and they have the great advantage of melting at a higher temperature. It often happens that inexperienced chemists melt their silver crucibles in heating them over a gas lamp; but such an accident is not to be feared in working with crucibles made of nickel.

VELOCITY OF RUNNING WATER.—A very slight declivity suffices to give the running motion to water. Three inches per mile in a smooth, straight channel gives a velocity of about three miles an hour. The Ganges, which gathers the water of the Himalaya mountains, the loftiest in the world, is, at 180 miles from its mouth, only 800 feet above the sea, and to fall these 800 feet in the long course of the river is said to require more than a month.

MINING SHAREHOLDERS' DIRECTORY.

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ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Alta S M Co	Nevada	26	25	July 3	Aug 7	Aug 27	Wm. H. Watson	302 Montgomery st
Andes S M Co	Nevada	22	25	June 27	Aug 2	Aug 22	E Burris	309 Montgomery st
Albion Con M Co	Nevada	14	50	July 17	Aug 20	Sept 8	A W Havens	309 Montgomery st
Bodie Con M Co	California	3	50	Aug 4	Sept 10	Oct 10	G W Sessons	309 Montgomery st
Chollar M Co	Nevada	12	1.00	Aug 2	Sept 6	Sept 28	W E Dean	309 Montgomery st
Con Virginia M Co	Nevada	19	20	July 11	Aug 15	Sept 5	A W Havens	309 Montgomery st
California M Co	Nevada	8	20	June 26	Aug 4	Sept 3	C P Gordon	309 Montgomery st
East Mt Diablo M Co	Nevada	3	05	Aug 13	Sept 17	Oct 3	G W Fisher	306 Pine st
Eureka Con M Co	Nevada	5	1.00	July 26	Aug 27	Sept 17	P Jacobus	309 Montgomery st
Grand Prize M Co	Nevada	14	25	June 25	July 27	Aug 20	E M Hall	327 Pine st
Holmes M Co	Nevada	7	30	June 27	July 30	Aug 21	C T Bridge	224 California st
Justice M Co	Nevada	39	10	July 9	Aug 13	Sept 3	R E Kelly	419 California st
Mexican M Co	Nevada	23	50	July 17	Aug 22	Sept 11	C L McCoy	309 Montgomery st
North Gould & Curry M Co	Nevada	5	25	Aug 9	Sept 11	Oct 1	C H Mason	331 Montgomery st
Ophir M Co	Nevada	45	1.00	July 28	Aug 31	Sept 20	C L McCoy	309 Montgomery st
Potosi M Co	Nevada	13	50	Aug 13	Sept 17	Oct 8	W E Dean	309 Montgomery st
Savage M Co	Nevada	56	50	July 19	Aug 21	Sept 10	E B Holmes	309 Montgomery st
Sierra Nevada M Co	Nevada	7	77	Aug 9	Sept 12	Oct 2	E L Parker	309 Montgomery st
Union Con M Co	Nevada	23	50	July 17	Aug 20	Sept 11	J M Buffington	309 California st
Utah S M Co	Nevada	45	1.00	July 20	Aug 27	Sept 14	G C Pratt	309 Montgomery st
Virginia Con M Co	California	10	01	July 24	Sept 3	Sept 24	A F Benard	364 Howard st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Alexander M Co	Nevada	2	1.00	June 20	Aug 6	Aug 27	J K Warren	307 Montgomery st
Bald Mountain M Co	California	2	3	June 26	July 27	Aug 30	L Shamnahan	125 First st
Campo Seco Copper Co	California	2	10	Aug 10	Oct 1	Nov 20	D Buck	309 Montgomery st
Como Eureka G and S M Co	Nevada	1	25	July 23	Aug 29	Sept 18	L Hermann	220 Sansome st
Eintracht G M Co	California	12	05	June 12	Aug 8	Aug 27	H Kunz	209 Sansome st
Excelsior Water and M Co	California	5	60	July 6	Aug 11	Sept 3	W J Stewart	215 Sansome st
Equitable M Co	Utah	28	25	July 24	Aug 31	Sept 28	C J Collins	512 Montgomery st
Genesee M Co	California	1	40	June 20	July 30	Aug 22	J Stoltfeld	419 California st
Golden Fleece Gravel M Co	California	3	50	Aug	Sept 3	Sept 25	Schirmeier	785 Folsom st
Hazard Gravel M Co	California	7	1	June 20	Aug 16	Sept 4	J T McGeoghegan	318 Pine st
Homeward-bound M Co	California	6	25	July 23	Aug 27	Sept 10	A S Bowie	314 Montgomery st
Homer M & M Co	California	3	10	Aug 2	Sept 8	Oct 2	F E Luty	330 Pine st
Lima Con M Co	Arizona	7	05	Aug 6	Sept 10	Oct 6	R D Hopkins	436 Montgomery st
Pittsburg M Co	California	16	10	July 24	Aug 28	Sept 18	H Wegener	414 California st
Roma Union M Co	Nevada	2	02	June 18	Aug 6	Aug 27	F N Simon	518 Sansome st
Swansea M Co	California	3	25	July 21	Sept 1	Sept 24	M A Wheeler	119 Market st
Sexton G M Co	California	3	8	July 31	Sept 5	Sept 27	A Martin	525 California st
West Branch Feather River M Co	Cal.	1	01	July 16	Aug 20	Sept 10	A B Paul	328 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Alaska M Co	A Judson	A Judson	320 Sansome st	Annual	Sept 4
Arnold M Co	A Judson	A Judson	320 Sansome st	Annual	Sept 4
Atlantic Con M Co	Nevada	D Wilder	328 Montgomery st	Annual	Aug 20
Campo Seco Copper Co	California	D Buck	309 Montgomery st	Annual	Aug 25
Independence M Co	Nevada	J W Pew	310 Pine st	Annual	Aug 29
Liberty Hill Con M Co	California	F E Luty	330 Pine st	Annual	Sept 6
Real del Castello M Co		A Judson	320 Sansome st	Annual	Sept 4
Villagrana M Co		A Judson	320 Sansome st	Annual	Sept 4

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Bulwer Con M Co	California	W Willis	309 Montgomery st	15	July 2
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	July 18
Mt Diablo M Co	Nevada	R W Heath	318 Pine st	25	Aug 23
Navajo M Co	Nevada	J W Pew	310 Pine st	25	May 14
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	Aug 12
Silver King M Co	Arizona	J Nash	315 California st	25	July 12

Table of Highest and Lowest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING July 26.	WEEK ENDING Aug. 1.	WEEK ENDING Aug. 9.	WEEK ENDING Aug. 16.
Alpha	1.90 2.00	1.80 2.00	1.70 2.30	2.00 2.50
Alta	.60 .70	.65 .70	.70 1.10	1.00 1.15
Andes	.40 .75	.35 .70	.65 .90	.75
Albion	.35	.35	.35	.05
Argenta	.05 .50	.15	.25	
Atlas				
Belcher	.85 1.15	.80 1.00	1.00 1.20	1.05 1.20
Belding				
Best & Belcher	4.00 4.30	3.75 4.30	4.25 4.80	4.10 4.60
Bullion	.75 .80	.70 .80	.90 1.28	1.10 1.25
Bechtel				
Belle Isle	.35	.40	.40	.40
Bodie Con	.65	.65 .70	.35 .45	.35 .40
Benton	.15 .20	.15 .20	.25 .20	.25
Bodie Tunnel				
Caledonia	.25	.25	.25	.20 .25
California	.05 .15	.25 .40	.40 .50	.40 .45
Challenge			.30 .40	.40
Chollar	3.50 3.85	2.90 3.30	3.00 3.25	3.20 3.60
Confidence	1.65 1.75	1.55 2.00	2.00 2 25	2.20
Con. Imperial	.10	.05	.10	
Con. Virginia	.35 .40	.30 .40	.35 .50	.40 .70
Crown Point	.85 1.10	.80 1.10	1.00 1.25	1.20 1.25
Day	.50	.35	.60	
Elko Con		.25	.30	
Eureka Con	4.75 5.00	4.80 6.00	5¼ 6.00	5.50 6.25
Eureka Tunnel	.50	.50	.55	.40
Exchequer	.40 .50	.40 .50	.45 .60	.60 .75
Grand Prize	.05			
Gould & Curry	2.80 3.05	2.55 3.15	3.00 3.70	3.15 3.65
Hale & Norcross	6.75 7.00	6.00 6.50	6.00 6.75	6¼ 6¾
Holmes				
Independence	.50	.45 .50		
Julia				.15
Justice	.10	.15 .20	.25 .30	.35
Jackson				
Kentuck	.30			
Martin White	.25	.20 .25	.30	.25
Mono	2.80 2.95			
Mexican	2.80	3.25 3.35	4.10 3.20	3.75
Mt. Diablo	5.50	5.00 5.50	5.00	
Mt. Potosi				
Noonday				
Northern Belle	6.75 7.00	6.75 7.25	6.75	6.50
North Noonday				
Navajo	3.05 3.40	3.10 3.25	3.10 3.25	3.15
North Belle Isle	.40	.40	.40	.40
Occidental	1.75	1.70 1.75	1.80	1.70
Ophir	2.40 2.70	2.40 5.00	3.85 4.20	3.50 4.15
Overman	.35	.30 .40	.35 .50	.40
Oro				
Potosi	1.40 1.60	1.10 1.40	1.25 1.35	1.20 1.40
Pinal Con				
Savage	2.25 2.40	1.80 2.20	2.05 2.25	2.05 2.40
Seg. Belcher	2.0 3.00	3.00	3.00	
Sierra Nevada	3.80 4.35	3.85 4.25	4.20 6¼	4.35 4.70
Silver Hill				.10
Silver King			6.50	3.90 6.50
Scorpion	.60 .65	.60 .90	.70 .85	.60 .70
Tuscarora				
Union Con	4.80 5¼	4.70 5.00	4.95 6.50	5.00 5.75
Utah	2.30 2.50	2.20 2.20	2.50 3.35	2.50 2.95
Ward				
Wales				
Yellow Jacket	2.75 3.50	2.80 3.05	2.95 3.65	3.30 3.55

Bullion Shipments.

Standard Con. (for July), $92,508; Mt. Diablo, Aug. 6th, $6,067; Gold Hill (Idaho), July 29th, $20,000; Mt. Diablo, Aug. 9th, $6,651; Northern Belle, 9th, $4,919; Bodie, 13th, $5,200; Standard, 13th, $13,613; Northern Belle, 13th, $4,814; Ontario, 8th, $4,701; Horn Silver, 8th, $6,000; Ontario, 10th, $4,583; Horn Silver, 10th, $12,000; Ontario, 11th, $4,636; Horn Silver, 11th, $12,000; Hanauer, 12th, $3,160; Horn Silver, 12th, $12,000; Ontario, 12th, $4,376; Hanauer, 14th, $6,300. During the week ending August 11th, in exclusive, there were shipped from Salt Lake 45 cars of bullion, 1,098,265 pounds, sent East, and 7 cars of ore, 219,900 pounds, sent West, making a grand total of 52 cars, aggregating 1,318,168 pounds.

Sales at San Francisco Stock Exchange

THURSDAY A. M., Aug. 16.

1000 Alta.....65c
350 B. & Belcher.....4
100 Belcher.....1
100 Benton Con.....15c
50 Bodie Con.....25c
200 Belmont.....1.10
720 Chollar.....3.15
300 California.....35c
30 Confidence.....2.10
680 Con. Virginia.....55c
50 Crown Point.....1.10
200 Exchequer.....55c
150 Eureka Con.....6½@6¾
270 Gould & Curry.....2.80@2.85
370 Hale & Nor.....5¾@6
100 Julia.....15c
860 Mexican.....3.00@3.10
130 Mt. Diablo.....4.80@4.85
30 Navajo.....2.40
800 N. Belle Is.....35@40c
300 Northern Belle.....6¼
520 Ophir.....3.30@3.35
100 Overman.....35c
50 Occidental.....1.65
550 Potosi.....1.20
580 Savage.....1.90@1.95
750 Sierra Nevada.....4.15@4.20
400 Scopion.....55c
50 Utah.....2.10
1035 Union.....4.60@4.65
120 Yellow Jacket.....3.05@3.10

AFTERNOON SESSION.

150 Alta.....85c
200 Belmont.....1.10
100 Bodie Con.....35c
925 Chollar.....3.05@3.15
950 Con. Virginia.....55@60c
350 California.....40c
10 Confidence.....2.15
200 Day.....50c
100 Eureka Con.....6¾
675 Gould & Curry.....3
750 Hale & Nor.....6@6¼
100 Independence.....50c
450 Mexican.....3.15
50 Mt. Diablo.....4.90
25 Navajo.....2.35
200 N. Belle Is.....35@40c
490 Ophir.....3.35@3.40
100 Overman.....35c
130 Potosi.....1.25
875 Savage.....2@2.05
855 Sierra Nevada.....6.40@6.50
400 Scorpion.....60c
100 Senator.....20c
25 Silver King.....6¾
100 Tiptop.....30c
180 Union Con.....4.95
30 Utah.....2.20
100 Yellow Jacket.....3.25

Mining Share Market.

There is not much doing in stocks just at present, the market being dull. Up on the Comstock work is going on as usual, with no new developments of moment. At the Combination shaft they have begun cutting out a station for the new hydraulic pump, at a point a few feet below the 2620 level. This station will be 25 feet wide, 14 feet high, and about 100 feet long. The Chollar folks will do no more crosscutting on the 2600 level until the new pump is in operation, as they do not wish to take the risk of tapping a flow of water that would interfere with the cutting out of the new station and the putting in of the pump. At Gold Hill they are doing what they can in the way of mining; but, owing to the fact that the mills on the Carson river can reduce very little ore, on account of low water, the amount of ore extracted is small. The Yellow Jacket folks are taking out some ore yet, but the amount will probably be gradually lessened. Not much, except in the way of exploring and prospecting, can be done in the Gold Hill mines until the fall rains give a good head of water in the Carson river. At the Alta they are now putting boxes into the drain drift leading out to the Sutro tunnel on the 1030 level. Also, they are putting in a pump tank at the shaft at the same level. They will soon be ready to commence pumping from the lower levels.

STEAM SPACE.—The *Milling World* says: The steam space of a boiler should not figure up too small a ratio of the whole boiler, lest in a sudden demand for steam, part of the water should be drawn out and uncertain fluctuations of the steam pressure be caused.

THE Louisville Exposition is a failure in the matter of attendance. On the opening day it was about 15,000, but at no time since has it gone above 3,000.

THE product of the Salt Lake mines for the first half of 1883 is given at $4,500,000.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned

CALIFORNIA.

Alpine

HOPE VALLEY.—*Monitor*, Aug. 10: Raycraft and Williams, who have been prospecting for mines during the summer, report a good claim in Hope Valley on the mountain range north west of the Steven's ranch. They report a sixty foot ledge. Samples from the cropping assayed 30 per cent copper and 11 per cent silver.

Amador.

NOTES.—*Ledger*, Aug. 11: The clean-up of Morgan's rock at the Kelly mill turned out satisfactorily. The working expenses were all paid from the proceeds. There is no change in the situation at the Jackson mine. It was to have started up again last Monday. I. N. Dewitt started prospecting operations this week in the Dewitt tunnel, running through Murphy's ridge. The Amador Mining Co. have notices out, calling for proposals for the construction of 1,000 ft of tunnel at the Mammoth mine, Middle Bar.

DRYTOWN.—*Dispatch*, Aug. 11: The Phœnix reduction works discharged all their men last Tuesday and closed up for an indefinite period. Mr. J. L. Goodman is still prospecting on the eastern extension of the Quartz Mountain claim with good results. Hayward and Hobart were at the Hercules, Meiss and Jennings claims, and have made an offer for the property, intending to consolidate the three mines. The Potosi mill, which was working ore from the North California, has closed down for want of water. The clean-up averaged $4.50 per ton, which paid expenses. The Seaton Co. have their shaft on the "Home Stake," down 500 ft, and have struck good sulphurets, and the ledge continues to widen. The adjoining claim—the Loyal Lead—is yielding handsomely. It is rumored that the Gover Co. will resume operations.

Calaveras.

GLENCOE DISTRICT.—*Chronicle*, Aug. 11: Dr. J. A. Griswold, who recently bought the Eldred mine and located the Victoria, in Glencoe district, intends to put men at work on both, for the purpose of sinking them 100 ft deeper.

CHISPA.—We were shown a chispa that was taken out of the Bonanza Hydraulic, on Tunnel ridge, that weighed an ounce and a half.

SLUMGULLION.—Kennedy, McNorton & Co., are having the rock from the Slumgullion mine hauled to the Harris mill, in Sandy gulch, for crushing. The rock will average $30 per ton.

WEST POINT.—J. F. Richardson, of the Star of the West mine, took some of the rock to San Francisco. The rock assayed at three different offices as follows: $1,000, $1,700, and $1,400 per ton. The ledge continues widening. Mr. Richardson has employed more help and intends putting up a new mill.

NEW COMBINATION MINE.—*Chronicle*, Aug. 11: Work is progressing at the New Combination mine, owned by Emerson & Co., on the east side of Old Woman's gulch. The shaft has reached a depth of 75 ft, and it is expected that in a few feet the channel will be reached and gravel struck. The machinery erected for the purpose of freeing it of water works to a charm.

El Dorado.

GEORGIA SLIDE.—Georgetown *Gazette*, Aug. 11: The Pacific has been taking out some good pay during the past month, and we learn that the Beattie is coming to the front again, after more than a year of hard work and little pay. The Blue Rock is reported to be doing well.

MCGEE & KELLY.—During the past six months Mr. Potter has crushed 100 tons of quartz from this new mine, with good results. Mr. Potter will also have a crushing to do for the Baltimore mine, three-quarters of a mile distant. The quartz looks well.

EUREKA.—Supt. Baird, of the Eureka, has been disappointed by the long delay of the arrival of the machinist from the East who is to put up the pulverizer, but a telegram says he will arrive to-day.

Fresno.

FINE GOLD DISTRICT.—*Republican*, Aug. 11: From N. N. Smith, recently returned from the foothills, we learn the following concerning the mines of Fine Gold district. The Abbey mine, owned by Wm. Robertson and Jesse Morrow, had a cleanup last week of 10 tons of rock which yielded $600. They have 75 tons of rock on the dump that promises still better. Their steam arastras are at work with a capacity of three tons per day. Work on the Stockton, owned by Stockton & Gaily, is pushed rapidly. They are opening two ledges, the rock averaging $50 per ton. The Hildreth continues to improve as they sink. The last cleanup paid $80 per ton. The Williams is looking well. The Smith has been leased by Smith and Morrow, who are taking out ore. The last cleanup yielded $60 per ton.

Inyo.

POTOSI.—*Independent*, Aug. 11: During the past week a new body of ore was struck in the lateral drift southward from the original Potosi tunnel, Cerro Gordo, at a point 725 feet distant. The ore uncovered is a rich chloride. The body of ore lies at a most favorable point, being just under the "open cut" from which has been extracted during past years some $200,000. The hills are alive with prospectors.

Mendocino.

NORTH PACIFIC LIGHT.—Ukiah *Dispatch*, Aug. 10: Yesterday we were presented with a number of specimens of ore from the North Pacific Light mine, by J. C. Cox, the owner. The mines are seven miles west of Yorkville, in the neighborhood of where the Gualala, Garcia and Rancherie all head. Four tunnels have been run in, besides an open cut 300 feet in length. A great many assays have been made, and the results have shown from 12 to 60 per cent of copper, with traces of gold and silver.

Mono.

NOTES.—Homer *Index*, Aug. 11: The Virginia Creek Hydraulic Co. has no doubt struck the old Mono channel, which proved so rich in the long ago, having encountered a gravel bed running diagonally across. The new find prospects from one bit to $2.50 to the pan. J. R. Crane is pushing a drift in the ore vein of Neptune No. 2, on the ridge west of old Mono diggings. The drift is now in 30 ft, the face being ledge matter with three feet of solid ore.

The Kentuck mine, Sweetwater district, is employing 30 men, and the mine has plenty of good ore in sight.

The Gorilla mine and reduction works are being run steadily.

Paul Rouze is running the Hallahan arastra on ore from the Rocky Point and Gold Band mines, and it proves to be of high grade.

George W. Esh is running his arastra in Upper Lake canyon on very rich ore from the Golden Prince.

The Collamer mine, Lake canyon, is turning out some fine ore.

Very rich developments have been made in the Detroit copper mine.

James McDonald has begun work on the Bryant mine, Lake canyon.

Nevada.

QUEEN BEE.—The Queen Bee Co. have been driving their tunnel for the past month and have struck a good prospect in quartz. The Queen Bee ledge, a long time ago, produced some very rich quartz. West and Spencer have the control, and it is their intention to push the worked.

LIVE OAK.—The Live Oak Co. are working a ledge down in the vicinity of the Lime Kiln, and the encouragement is good.

POWNING.—The Powning Co. are sinking their shaft. It is supposed, that this is on the famous Eureka and Idaho ledge. The shaft is down 34 ft, and some of the pieces show free gold.

FROM THE RIDGE.—San Juan *Times*, Aug. 11: We made a trip to the Derbec mine on Sunday. Mr. DeNoon, the superintendent, was melting gold. He showed us two gold bricks, which were 6 inches long, 2½ inches thick and 3 inches wide. He was, when we left, making another of the same dimension.

SWEETLAND.—The Manzanita has cut down its force of men to 18 or 20. It is understood that no further washing will be done in this mine until the rains of winter fill the ditches. The dire results of the English dam outrage are making themselves severely felt. I am informed that from 125 to 200 men will be thrown out of work for want of water. As many of these men are the heads of families, the situation is a hard one.

SHERMAN.—Cor. *Transcript*, Aug. 10: There has been talk in relation to closing down of the works of the Sherman Con. Mining Co. The facts are these: A shaft was started months ago, and owing to the influx of water larger machinery was ordered, and everything has been running smoothly until within a few days. After getting the shaft down 140 feet it was found that the ledge was pitching in a different direction. The pumps will also be pulled up, but work will be resumed at no distant day.

THE IDAHO MINE.—Grass Valley *Tidings*, Aug. 12: Supt. Coleman informs us that the drift and backs in the 12-level are looking well, in fact the ore from this level is about as good as any that has ever come out of the mine.

EMPIRE.—The Empire is doing well; the rock is rich in specimens, and the general quality of the ore is more than average. The company is making arrangements for re-modeling the mill. The mill will be almost new when the work is finished. The Empire is the oldest worked mine in this district.

Placer.

GOLD BLOSSOM.—*Herald*, Aug. 11: Last Saturday, DuBois, Supt. of the Gold Blossom quartz mine, brought to town a gold brick, the product of a recent cleanup, that weighed 17½ pounds and was worth $4,000. Since this mine started last January it has run steadily. We understand that the size of the ledge holds out and the rock becomes more uniformly rich as they go down.

IOWA HILL.—*Argus*, Aug. 9: Prof. Blake, of the Providencia, is running a tunnel 200 feet with a view to develop the mine. If everything is favorable he will put up a mill. Mr. Weske has nearly completed an air shaft 300 feet in depth to afford the necessary ventilation. He expects to have fifty men at work. The main tunnel extends into the hill 1500 feet, and prospects are very good. Mr. Ossig has located a ledge near Grizzly Flat, which he says prospects well.

RATTLESNAKE BAR.—Mr. Bolcs is fitting up his river claim, preparatory to mining. He expects to have the pumps started in about four weeks. Mr. Zantgraf is running his quartz mill, and apparently with good results.

LITTLE YORK.—*Times*, Aug. 11: The mining season is about over, though the Little York mine is still running water and expects to continue working some time yet.

Plumas.

RICH GULCH.—Quincy *National*, Aug. 11: A. D. Hallsted and Frank Hill, from Rich gulch, tells us that on Saturday a very rich body of ore was encountered, better than anything yet found. They are making arrangements for the erection of a small mill. The ledge is extensive, the pay uniformly distributed through the quartz, and it is located so that great depth can be gained without large delay.

RIVERDALE MINE.—The machinery is all in place, and regular work on the shaft will be the order of the day from this time on. The machinery is strong and substantial, and the pump capable of handling twice as much water as will be encountered.

CLAREMONT PEAK.—The Claremont gravel is improving as depth is gained. Nearly 50 men are at work. Claremont peak will be a noted drift mine for many years to come.

San Bernardino.

THE KING MINE.—Calico *Print*, Aug. 11: We remember the "expert" Hammer, who published his opinion that the King mine would produce no ore below a depth of 200 ft. This year ore has been taken out 375 ft below the surface, and the quantity and average grade of the ore is gradually increasing. Last Monday, between the third and fourth level, a very rich strike was made in this mine. A vein of ore 2½ ft in width was uncovered that averaged from numerous samples taken from various points in the vein, $1,280 to the ton. These indications are that it extends to a considerable distance. The average returns of the ore taken to the mill have exceeded the average assays that were made quite often, and now reach $103 to the ton. It was intended to turn out $50,000 worth of bullion last month, but instead

about $60,000 worth were produced. There are several thousand tons of second and third-grade ore on the dump that will go from $25 to $50 to the ton, and average about $30 to the ton.

Shasta

WHISKYTOWN.—Cor. *Courier*, Aug. 11: I. W. Zent has put a force of men on the Red Rover, a mine which he has recently purchased. A Burleigh drill will soon be set at work in the Mad Ox mine. I have visited the Banghart mine. I was shown some very fine specimens. Habich & Bell have suspended work on their mine until the hot weather is over. Times are flourishing.

SOUTH FORK.—Cooper & Smith's arastra is running on their own ore. At the mine they are sinking a new shaft, air had in the drift. Ballou's arastra is running on his Manzanita ore. Crum's arastra is running on ore from Wright & Ormsby's ledge. Crum & Hubbard's Pacific mine is looking well. A new vein was found recently. Robinson & Co.'s arastra is running. H. Rothwell has been at work on his Crystal mine. Kingsbury & Dunham expect to resume work on their ledge soon. Water is getting scarce, although there is still sufficient for running the arastras.

Tuolumne

NOTES.—*Independent*, Aug. 11: Jim Gillis has struck a pocket at Jackass Hill in which he gets $20 to the pan. The pump has been taken out of the Rappahannock mine and the shaft allowed to fill up. Owing to the scarcity of water, the "Riverside" Co. has closed down the mill. The "Heslep" mill, at Quartz mountain, is running but few stamps for the same reason. The quartz mining outlook about Soulsbyville is very cheerful. The Patterson Mining Co. are putting a pump in their shaft; forty columns of iron pipe passed through town Wednesday. Rawhide, the once famous camp is deserted since Brisbie and the Rappahannock pump has pulled out and gone. The old store is closed.

NEVADA.

Washoe District.

HALE AND NORCROSS.—*Enterprise*, Aug. 8: The streaks in the bottom of the winze sunk below the 2600 level, continues to show rich ore. The winze is fast nearing the 2700 level, at which point crosscuts will be run both east and west.

RICH STRIKE.—Some streaks of very rich black sulphuret ore have been found in the Keyes and Wheeler claim, on Seven-mile canyon, between the Omega and Winfield mills. A two-compartment shaft was sunk to the depth of 225 ft. They then sunk 20 ft through fine looking quartz, when ore was found. Where the ore first came in it was only an inch in width, but in going down four ft, it had widened to three ft. This is not all solid ore. There were streaks of rock that look like limestone. Against this, lie streaks of very rich black sulphuret ore. Several pieces were brought to town yesterday. An assay of the black sulphuret yielded: Gold, $569.18; silver, $1,469.90; total, $2,039.08. There is no mistake about the richness of the ore and there is indication that they are close upon a body of considerable size. The strike is in the range of the Monte Cristo, St. John's and Occidental mines.

STILL RICHER.—*Enterprise*, Aug. 9: Yesterday a number of samples of ore from the Keyes and Wheeler mine were brought up from Seven-mile canyon, the largest being several pounds in weight. These samples were of ore taken out night before last. The ore shows both black sulphuret and chloride of silver. An assay, made yesterday, went over $2,600. A hoisting engine will be put up and sinking vigorously prosecuted. This strike will doubtless cause the resumption of active prospecting along the line of the great eastern fissure. The Sutro tunnel showed nothing but barren country rock till this fissure was reached. Between it and the croppings lies the vast mass of vein material composing the ore channel of the Comstock. This eastern boundary of the great lode may yet prove as rich as the western, though probably not so extensive.

UNION CON.—*Enterprise*, Aug. 11: The north drift toward the Sierra Nevada line, on the 3000 level is now out 10 ft. Work has been discontinued in it till it can be timbered up at the point where it starts from the main west crosscut. The face of the drift is still in low-grade ore. Good progress is making in the joint Sierra Nevada winze below the 3000 level.

HALE AND NORCROSS.—Work in the winze below the 2600 level was retarded during the first part of the week by the heat and bad air that came in from the south drift of the Chollar, which was opened for the removal of the air pipes, drills, track rails and the like.

ALTA.—Drain boxes are being placed in the drift leading out to the Sutro tunnel on the 1030 level, and a pump tank is being construeted in the shaft at the same level.

OPHIR.—Have finished cleaning out the drift leading to the old Mexican shaft from the Central tunnel. A drift is now being run west for the ore vein.

CON. VIRGINIA.—The south drift on the 2700 level is going ahead at the rate of 16 ft per week. Good headway is making in the joint California drift.

MEXICAN.—The upraise from the 2900 level advanced at the rate of 10 ft per week, in hard rock.

SIERRA NEVADA.—North lateral drift No. 1 on the 2900 level is advanced at the rate of 20 ft per week.

YELLOW JACKET.—A considerable amount of ore is still being extracted from the old upper levels.

UTAH.—The repairs to the vertical shaft are completed, and work has been resumed in the west crosscut on the 1350 level.

CALIFORNIA.—The joint Con. Virginia drift from the C. and C. winze, at the 2800 level, is making good headway.

CHOLLAR.—No further prospecting will be done on the 2600 level until the new hydraulic pump is in operations,

ANDES.—Some quartz, giving good assays, has been cut in the west crosscut.

BEST AND BELCHER.—All is going on as usual in the lower levels.

GOULD AND CURRY.—The usual progress is being made.

SAVAGE.—The work of crosscutting will soon be commenced on the 2600 level,

SCORPION. Are still pushing the west crosscut on the 500 level.

UNION SHAFT. Are making repairs to the 2300 station.

Belmont District

NOTES.—*Courier*, Aug. 4: The Jefferson S. M. Co's mill produced bullion valued at $9,000 since the 21st ult. The mill is now undergoing repairs, and will soon be started up again. The Tybo mill will start up to-day on ore from the 2-C mine. The Prussian mine at Jefferson is said to be looking well and good ore is being extracted. A number of Eureka miners came in on Thursday to work in the Belmont.

Candelaria District.

NORTHERN BELLE.—*True Fissure*, Aug. 11: The daily output of ore is about 43 tons. Both mills are doing good work. The total bullion shipments for July were $53,531.12. There has been $10,192.25 in bullion shipped on August account up to the 9th instant.

MOUNT DIABLO. Some good chloride is being taken from the first level near the shaft, and some $70 ore from the Mount Diablo adit. The total bullion shipments on July account were $74,276.96. A shipment was made on August 3d of $10,424.87, and another on the 6th instant of $9,066.51.

LIDA VALLEY. Two lots of ore from the Morning Star, the first eastern extension of the Death valley lode, have been worked. One paid $207 per ton, the other $168. The ore from the Pontiac mine paid $377 per ton. The mill company, composed of Messrs. Stewart & Vollmann, is crushing ore from the mines in Death valley. The first bullion shipment was made the 5th instant, one bar weighing 1,100 ounces. The mill will be kept running indefinitely. The returns have just been received from three lots of high grade ore sent to San Francisco for reduction. The lot from the North Star paid $1,320; from the Morning Star, $750; and from the Sewana, $1,335 per ton.

Eureka District.

KATIE RYLAND MINE.—*Sentinel*, Aug. 11: Mark and Jim Cowling yesterday, at a depth of 30 ft, struck a body of free-milling ore, a specimen of which was brought to town and assayed. One part of it went $1,876, and another $5,060.30. It is chloride of silver in quartz. The mine was located in 1872 as the Paul Jones; afterwards relocated, and still later bought.

Humboldt District.

HUMBOLDT QUEEN.—*Silver State*, Aug. 8: Marion Howell, just up from Rye Patch, brings a specimen of ore from the Humboldt Queen mine. He says J. W. Mills is taking out, with four men, eight tons a day. He has on the dump 900 tons of ore that will average $100. The ore is assorted when taken out, the high grade being worth $300 to the ton, as has been proved by working tests. The ore on the dump is estimated to be worth $200,000, after allowing a margin for hauling and milling.

Pioche District.

OSCEOLA.—*Record*, Aug. 4: There has been an immense amount of gold specimens taken from the Osceola placer grounds. Mr. Godbe, Sr., has on deposit at the Desert Bank of Salt Lake a box containing a couple of thousand dollars' worth. One is a large granite bowlder thickly covered with the yellow metal, and valued at $400.

Safford District.

ONONDAGA.—Eureka *Sentinel*, Aug. 8: Francisco Thoma, who came up from Safford Monday, informs us that things are looking well. In the Onondaga they continue in ore as they sink. They have gone down nearly 100 ft in the prospect shaft, which is still in ore. Rock taken from the bottom of the shaft assays $300. The width of the ledge at the depth reached is unknown. The purpose of this shaft is to determine whether the Onondaga is a mine, that is, whether its immense surface deposit extends far below, and it will be sunk 500 ft. The shaft is being sunk through a solid body of ore, and the daily yield from it and from stoping the surface bodies is 20 tons. This will yield probably from $80 to $90 per ton. The Zanoli looks very fine. The drift from the shaft at a depth of 50 ft is in 40 ft. A body of ore nearly four ft wide has been followed for this distance. The ore is yellowish green carbonates, which will average about $60. No shipments have been made, and the ore accumulated lies still on the dump, on which about 150 tons are piled up, worth about 60 ounces per ton. There are some thirty men at work in the camp.

Tuscarora District.

COLUMBUS.—*Times-Review*, Aug. 6: The mill at Columbus has suspended for a few days, awaiting the arrival of ore from Cornucopia. A road is being graded to the Polari's mine, which will be completed in a few days, when ore hauling to the mill will commence. There is ore enough, easily accessible, in this mine to keep the stamps running continuously. Clark and McClay's concentrator is accumulating high grade concentrations for shipment. The Blue Jacket mine belongs to the Blythe estate, now in the hands of the executors in San Francisco, but arrangements will be consummated for the early extraction of ore. The prospects for the district were apparently never more favorable than at present.

ARGENTA.—East drift, 300 level, extended 11 ft. North crosscut, 400 level, 13 ft.

INDEPENDENCE.—Total length of drift south, 400 level, 919 ft. Drift north, 300 level, total length, 670 ft.

GRAND PRIZE.—West drift 300 level, extended 12 ft. South drift, 10 ft. South drift, 400 level, 14 ft.

NAVAJO.—*Times*, Aug. 3: During the past week work underground was suspended for a time, owing to repairs being made on the hoisting engine. Have commenced cutting a station at the 650 level. Foundation for the compressor has been completed. Are ready to place the machinery in position as soon as it arrives.

BELLE ISLE.—During the week the hoisting engine has been under repair, and work suspended. Total length of drift north on the 450 level, 184 ft: progress, 7 ft.

NORTH BELLE ISLE.—Fair progress has been made in extending the drift south on the 300 level. Total length, 463 ft.

INDEPENDENCE.—Total length of drift south on 400 level, 885 ft. Progress during the week, 29 ft.

ELKO CON.—That portion of the building covering the engine, machinery and boiler has been completed, and the gallows frame placed in position. Will start the machinery for trial the latter part of this week.

GRAND PRIZE.—South drift, 400 level, is in 65 ft: progress for the week, 15 ft. The vein is two ft wide. The stopes below this level produce some good ore. The rebuilding of the works will soon be completed.

ARGENTA.—West drift, 300 level, extended 10 ft. The face of drift is in favorable ledge matter. Have started a crosscut north, on the 400 level.

ARIZONA.

NOTES.—Prescott *Courier*, Aug. 4: Bigelow and Hatz are shipping ore from mines owned by them in Hassapampa district. The United Verde Copper Co.'s smelter has turned out its first bars of bullion. The Howell Co.'s stamp mill will be run the first time Saturday next, on Belle gold ore. Gavin & Co.'s shaft in the Pine Spring mine is down 43 ft, at which depth the ledge is large; ore worth over $20,000.

LANE DISTRICT.—J. M. Lane has driven a tunnel 300 ft on the Three Sister mine. He was here recently with samples of his ore, which is good for $300 to the ton. He will soon have a batch worked in the Tip Top Co.'s mill.

BLACK HILLS.—E. J. Austin tells us that the furnace will, to-day, commence running out copper. To give an idea of the sort of mines they have over there, it is but necessary to state that a miner named Lynch has for a month taken out at least a ton of ore daily, which ore goes from 40 to 60 % in copper.

PECK DISTRICT.—W. A. Rowe returned from Peck district a couple of days ago. The Black Warrior mine is looking fine. The mill is running. A shipment of three bars of bullion, 900 fine, reached Prescott yesterday. L. Able's West Oro Bonita mine has sulphuret ore, which assays $942 per ton. Two carloads of machinery reached Turkey creek, Sunday. C. C. Bean has made arrangements in New York for a smelter for Copper basin.

SILVER KING.—Pinal *Drill*, Aug. 4: In the Silver King work goes on as usual. At the mill they had to hang up the stamps owing to lack of water. In reference to the report that dividends are to be suspended, the *Drill* says: "The Silver King may be weak in the stock board, and who cares except the gamblers? But the Silver King is stronger than ever in the earth, and the company employes more men than ever, and have more rich ore thanit can handle. They pay their men who work at the mill and mine, and whether they pay any dividends or not doesn't affect us or the mine. There is probably not over 10,000 shares held by outsiders. All the rest is owned by the managers of the company. The Silver King will have to build a 100-stamp mill at once, or be choked with ore, and they are probably saving their dividends for the purpose."

NOTES.—On the Monarch of the Sea, they have greatly enlarged their working force. They are taking out good ore. It is undoubtedly the coming mine in Arizona. They have worked at it quietly, but to-day they employ more men than any other mine in the vicinity with the exception of the King. They have cut through the hill 275 ft and find metal everywhere. On the Eureka, they have this week shipped 15 bars of bullion; value, $1,500 to $2,000; 15 men are employed in the mine. On the Surpriser they are working 10 men; they have opened four drifts and the result has been good gold quartz.

CRITTENDEN.—Tombstone *Epitaph*, Aug. 7: The mining properties in that section seem to be looking up, and a determined and united effort is being made to secure the erection of a smelter at Crittenden. It is expected that operations will be resumed on the Gringo mine, the property of a West Virginia Co., on the 15th. This company has a good amount of high grade ore on the dump. In Temporal gulch, Tom Hughes and Dan Lyons have the main shaft on the Rupert down over 80 ft in a fine body of ore. The Blue Nose, Patagonia district, owned by Messrs. Clay and Dunn, is being worked by a single shift, and the ore is shipped to the Benson smelter, with good results.

COLORADO.

NOTES.—*Gazette*, Aug. 4: A large quantity of surface quartz shipped from the Niagara lode, Spring gulch, to the Mott concentrating and reduction works, runs from 4 to 6 ounces in gold to the cord. An assay of ore from the Perkins tunnel lode shows 13 ounces gold, 25 ounces silver, total value $292.78. Ore covered with free gold continues to be taken out. The Mountain City lode, in Cascade district, is showing well in the shaft, now 135 ft deep. There are 14 inches of first class concentrates on the hanging wall. About 20 tons of rich smelting ore have been shipped from the Champion to Black Hawk during the week; two carloads of high grade from the Donaldson mine. The shipments preceding these returned from $170 to $190 to the ton. On the Freeland mine, recent developments have opened up far richer bodies of ore than have ever heretofore been struck. In the east lower level of the Eclipse mine six inches of solid gray copper that assays $1,090 per ton has come in on the hanging wall. A shaft 9 by 4 in the clear will be sunk immediately at the entrance of first level west.

ROLLINS.—*Register-Call*, Aug. 3: Yesterday there was left at the First National Bank, 138 ounces and 8 pennyweights of egg-shapped gold retort, produced by 31 stamps during the past two weeks.

A GREAT CORPORATION.—The incorporation papers of the Omaha and Grant Smelting Co. were filed with the Secretary of State on Friday. The combining of the Grant and Omaha Cos. makes the greatest ore smelting company in the United States. The capital stock is fixed at $2,500,000, and the company is to exist for a hundred years.

IDAHO.

NOTES.—*World*, Aug. 3: Don Henderson and Hugo Bayhouse discovered a ledge near the head of Henry creek the other day that carries free gold. The vein is four inches wide, and the ore runs $300 per ton. Henry Clifton is placer mining the other side of the Moore creek summit, near the Banner road. The ground is five ft deep and pays from the grass roots down to the bedrock. It is what is known as the Tatro diggings. The ground is being worked by hydraulic process. Curtis Estes arrived yesterday from Yankee Fork. The Custer mill is running on ore from the Unknown mine. The owners of the Montana mine will have their low grade ore, 500 tons, put through the Custer mill. Joe and Wm. Galatian are developing the Whale. They will make a shipment of high grade ore. The low grade will be crushed in the Custer mill. Mr. Estes showed us specimens from his placer claim on Estes mountain, the largest worth $27.

WOOD RIVER.—*Times*, Aug. 1: The Bullion Con. M. Co. are to erect at once a very complete concentrating mill, the machinery for which is already here. It is to be provided with massive appliances, embodying the latest improvements, selected with great care after visiting the various manufacturers in the Eastern States and a careful inspection of the most successful mills now in operation. The capacity is 50 tons daily, with power for 100 tons. A. P. Minear is superintendent.

THE O. K. MINE.—A lot of 62 tons which was sent to the Philadelphia Co.'s smelter, above Ketchum, Saturday last, was purchased by that company. After deducting all expenses, including hauling, railroad transportation and smelting, Mr. McQueen received a net return from the 62 tons of $8,129.81. The ore was sampled at 124 ounces in silver and 71 lead per ton, all through.

SAWTOOTH.—The Solace, Mountain King, Silver King, Vienna, Scotia, Hidden Treasure, Sunbeam, and other mines are being developed in the Sawtooth section. Mr. Vernon, of the Columbia and Bear Mill Co., will start up the mill Saturday, taking all the custom ores offered. The mill will run six months at least, by the leaching process. The Hidden Treasure mine is one of the most valuable prospects in the Sawtooth country. Over 100 miners are at work in the district. This does not include Vienna and immediate vicinity.

THE PHILADELPHIA SMELTER. Ketchum *Keystone*, Aug. 1: The two new 50 ton furnaces at the Philadelphia smelting works, which are constructed after the pattern of the famous Grant smelter, at Denver, stand complete and in full operation, with a capacity of 100 tons. These furnaces, which are perhaps two of the best in America, were built to accommodate the increasing output of our mines and prospects and now have met an urgent demand for increase reduction facilities. It is estimated that as many as 50 large teams are employed constantly between the mines and sampling works and the smelters. The Philadelphia Co. has secured all the Wood river ores and there now seems no question on the part of miners but that of getting out the mineral.

MONTANA.

FLINT CREEK.—Cor. *New Northwest*, Aug. 3: The Shields mine, belonging to Edgar, Godfrey & Co., is developing first-rate, a large quantity of very fine ore having been taken out during the last fortnight. This company owns or has the controlling interest of six mines, beside mill and smelter sites.

A NEW DISTRICT.—Quite an interest has been created about Pioneer, in regard to rich gold and silver quartz discoveries at Henry Martin's camp, near the headwaters of the left hand fork of Gold creek. It is reported that assays of the ore have run over 400 ounces in silver and $25 in gold per ton. The camp is about seven miles from Pioneer.

SUMMIT VALLEY.—Butte *Miner*, Aug. 1: During the past week, silver bars valued at $47,024 were shipped through Pacific Express, 10 tons of which are credited to the Moulton, valued at $12,950; 10 to the Alice, $15,004, and 10 to the Lexington, $19,024. Gold dust was also shipped by Donnell, Clark and Larabie valued at $21,400.

ALICE.—The 80 stamps of the Alice mills are dropping upon about 90 tons of ore per day, with average battery samples of 41 ounces.

MOULTON.—Ore is being stoped from the 200 west drift, where the ledge of high grade is looming up bigger than ever, having widened to 6 and 7 ft of solid pay ore of high grade clear across the face. The mine may be said to be looking better throughout than ever before.

NEW MEXICO.

THE OLD MAN.—Of this claim, at Camp Fleming, the South-West *Sentinel* of the 4th says: Notwithstanding the small amount of development work, two thousand tons of ore are in sight, and four hundred on the dump that will average one hundred ounces in silver to the ton. In addition to this, three hundred sacks of high grade ore that will average four hundredounces of silver are awaiting shipment East for treatment.

TURNER.—The Turner mine at Bald mountain, is the richest yet discovered in the district. The average assay return from eight assays taken from the bottom of the shaft was $424 of silver to the ton.

SHERMAN.—Some choice ore is being produced from the Sherman mine by the Williams Bros. They have continued the original tunnel, which has already gone through three rich pockets of ore, and they have just struck another, which is even richer. Some of the ore runs into thousands of ounces of silver to the ton, and a low average would be 30 ounces.

SILVER CITY.—*Southwest Sentinel*, Aug. 8: A large body of ore full of horn silver and chlorides has been struck in the main shaft of the Old Man. The ore will average 500 ounces to the ton, and covers the entire bottom of the shaft, at the depth of 60 ft. Rich ore has also been struck in the incline, the mouth of which is 100 ft north from the main shaft, and with which it will connect. One hundred ft west of the incline, another rich body has been found, at the depth of about 10 ft. This indicates a triangular block of ore, with base and perpendicular of 100 ft each, and averaging 250 ounces to the ton.

OREGON.

RICH COPPER ORE.—Walla Walla *Union*, Aug. 4: A year ago a vein of copper ore was discovered 40 miles northeast of Baker City. The indications are rich; specimens assaying 80% of copper and $75 per ton of gold and silver. A company has been organized in Walla Walla, and men have commenced work. This company have a continuous claim 600 ft wide by 12,000 ft long. Mr. Booth, of Seattle, reports that he measured the croppings on one of the claims, and believes that it is the largest and richest body of copper ore that has ever been discovered in the United States. Captain Hoasten of the Lake Superior copper mines inspected the mine and reported to the company that if there is one-tenth of the ore there that the croppings indicate, the mine is worth millions of dollars.

The Triennial Conclave.

Who are the Knights Templar?

The origin of Masonry is shrouded in the haze and twilight of antiquity. Whether it originated in the mysteries of Isis and Osiris in Egypt, or of Eleusis in Greece, or had some relation with the sun and star mythology of Persia, as many think, or originated at the building of King Solomon's Temple, as our best Masonic archæologists believe, is a matter really of very little consequence. All admit that it is the most ancient fraternal Order in the world, the trunk-principle, the mighty tree; under whose boughs all other secret Orders have sprouted, and drawn their vitality and inspiration. The early Masons were a peaceful class, fond of science and occult studies. Possessing considerable knowledge of the laws of proportion, harmony, symmetry and beauty, and bound together by mystic words and signs, they went forth from some central school or Lodge, to build the palaces of Kings and the fanes of religion. Their symbols have been found under the obelisks at Alexandria, on the ruins of Karnac, and their cabalistic marks may still be seen on the magnificent cathedrals, the spacious arches, and pilasters of mediæval Europe!

But no dark cloud of myth or tradition hangs around the origin of the Order of Knights Templar. We know its date, and the path it has come. It was the child of war, born sword in hand, and cradled on a shield. Its history begins with the crusades, those tornadoes of religious and military enthusiasm which blew at intervals across Europe for three centuries. At the breaking out of those wars, the sons of noblemen, stimulated by piety, love of glory or adventure, wild, restless spirits who loved martial sports and the bustle and excitement of camp-life, offered their services, and were taken into the pay of the great barons and chieftains. The prowess, the daring and renown of these valiant Knights, have been celebrated in romance, art, poetry and song. Among the numerous Orders that sprung from this form of Knighthood, the Hospitalers and Templars are the best known, and most distinguished. The Hospitalers, or Brothers of St. John of Jerusalem, or Knights of Malta, as they were subsequently called, were instituted in 1040 for the purpose of nursing the sick and wounded crusaders, and consoling the dying. It was the first Sanitary Commission that ever followed the burnt path of war. After being driven out of the Holy Land, they first occupied the island of Rhodes, and then Malta, whence they were expelled by Napoleon Bonaparte, in 1798.

The Order of Templars was founded in 1118. Nine French gentlemen, pious and valiant Knights, bound themselves under solemn vows of charity, poverty, and obedience, and to employ their swords in defense of poor pilgrims on their way to the Holy Sepulcher! Their rigid austerity, their valor, and enthusiasm soon attracted the attention of their King, Baldwin II., who gave them an apartment in his palace, near the supposed site of King Solomon's Temple. Hence they became known as Knights of the Temple or Templars. The rules of the Order were prepared by the Council of Troyes, and ratified by the Pope. They were commanded to wear white mantles in order to distinguish them from the Hospitalers. The Red Cross was also prescribed by this Council as a badge of distinction, and was worn over the heart. For many years the Templars lived in great poverty, fed and clothed by charity, and giving all they could spare to the poor pilgrims who had been spoiled by the enemy. So poor were they that two often rode the same horse, and a rough, cheap dagger was all they could offer as a ransom for a captured brother. They were very pious, in accordance with the gloomy aceticism of the day, that believed the Devil was in everything bright, beautiful, and enjoyable, and could only be driven out of human nature by a watery diet, horrid smells, and a bad air. The motto upon their banners, "Not unto us, Oh Lord, not unto us, but to Thy name give the glory," was no empty declaration of self-abnegation. They ate in silence. It was unbecoming a good Knight to indulge in boasting or frivolous conversation. The Evil One was concealed in a laugh or joke, and to kiss even a mother or sister was considered as dangerous to the purity of the heart and desires, as the touch of frost on flowers.

But this rigid, monkish austerity did not last long. The Count Anjou made a pilgrimage to Jerusalem, and became so deeply impressed with the piety and valor of the Order that he joined it; and his example was soon followed by other pious and chivalrous princes. The Order rapidly became the most popular and powerful in Europe. The spoliation of the heathen, and the donation of kings and noblemen made it extremely rich; and the vow of poverty was forgotten. The Templar never lost his courage, but the stout arm which had flashed the sword where the battle raged the fiercest against the Saracen, in luxury and ease, had lost its cunning; and when the Great Saladin mustered his hosts to recover Jerusalem, he won an easy victory at the battle of Hittin. When the Crusaders were finally driven out of Palestine, the Templars were the last to yield. They threw themselves into the strong fortress of St. Jean d'Acre, and there fought their last battle for the possession of the Holy Sepulcher, only eight or ten escaping the terrible carnage. The shattered remains of the Order fled to Cyprus, and elected Jaques De Molay, Grand Master, and for a season prosperity smiled upon them, and they again became rich and powerful. But their wealth became an object of envy to Philip IV., King of France, and he persuaded Pope Clement V., a servile minion he had elevated to the Papal See, to suppress them. They were accused of the abominable heresy of Ophidic, Gnostic, and even Mohammedan practices; especially the worship of the Baphomet, a human figure carved out of stone, with two heads, male and female, and entwined with serpents and astrological devices. De Molay was enticed to Paris, and treacherously seized and burned alive. A large number of his followers suffered the same fate. Fifty-four Templars were burned in Paris the same day. With the death of Molay, it was supposed the Order had perished, but he, in anticipation of danger, had appointed John Mark Samienius his successor; and the chain of succession of Grand Masters from him, has never been broken.

The encampment of Baldwin, established at Bristol, by Richard I., on his return from the Holy Land, preserved the ancient costumes and ceremonies; and this, in connection with the one at York, and another at Bath, constitute the original Encampments, from which all the British and American Commanderies now in existence have derived their authority.

The Templars, broken up as a military Order, no longer permitted to poise the lance or join the tourney, or hold public meetings, met in secret places, in caves and glens, and the somber depths of the forest, and agreed to make war upon vice in all its ugly shapes, using their ancient weapons of bloody strife, as the symbols and emblems of a spiritual warfare. The Knight, wearing the cross, wielding his sword in defense of innocent maidens, destitute widows, helpless orphans, and the Christian religion, may come into sweet fellowship with the spirit of the Crucified One, which has been aptly called an "enthusiasm for humanity." As long as the soul lives in the body, it carries about a burning taper that may easily be blown out. The heart should ever be clad in penitential garb, for what is life but a pilgrimage, and are we not all looking anxiously forward to that asylum, that house not made with hands, eternal in the heavens. And that must be a very cold, apathetic nature that can stand around the Knightly triangle and join in the ascension hymn, and not feel that life is more than a thought or memory, more than a blossom on the stem of organization; that the soul has powers which sweep beyond the world of time and sense, and carries within it the earnest of a grander destiny.

Another Big Hydraulic Pump.

A contract with the Risdon iron works, San Francisco, has been signed for another big hydraulic pump. The pump is to be completed within 100 days. It will be of the same capacity as that now in operation. It will be placed at a point ten to twelve feet below the 2620 level.

At this place will be constructed a station twenty-five feet wide, fourteen feet high, and from 90 to 100 feet long. The pump will have upon it over 200 feet more pressure than that at the 2400 level. Once it is in and ready to run, it will release the Cornish pumps now in operation below the 2400, and they will be used below the 2600 level to pump up to the lower hydraulic pump.

The station and foundations for the new pump will be completed as soon as possible, and the several parts of the pump will be set up as fast as received from below. Such parts as will be first required will be first manufactured.

This pump will cost a great deal less than the first. There will be no costly surface engine required, as for the first pump, nor will it be necessary to put in new pipe all the way down. The cost, as divided up among the several companies interested in the shaft, will be less than twenty cents per share, and will be so divided that never as much as seven cents per share will be required at any one time. In fact, the cost of the pump will not be noticed by the stockholders.—*Virginia Enterprise.*

The Philadelphia Smelters.

The New Furnaces Completed.

From the Ketchum (Idaho) *Keystone* we take the following:

The new furnaces at the Philadelphia smelters have a capacity of fifty tons each instead of forty tons, as many of the newspapers have seemed to suppose, thus making a total capacity at the works of 180 instead of 160 tons daily. They now stand complete, with the exception of a few details, and are being dried out preparatory to receiving the blast, which will occur within one week. They are accompanied with every improvement possible, and stand as model types of smelters. The machinery in other parts of the mill is complete in every detail, and the necessary additions for the increased capacity, such as workmen, fuel, etc., have been secured.

The ore receipts have perceptibly increased during the past two weeks, and an immense quantity has accumulated in the new main buildings and ore platform recently built to accommodate the surplus from regular hins. It now continues to arrive at the rate of about sixty tons daily, exclusively of ores from the Conklin sampling works. The rate of receipts, together with the large quantity on hand, will be seen as quite sufficient to supply the full capacity henceforth, growing patronage not considered. The chief supply continues to come from the Elkhorn mine, which ships from ten to thirty tons daily, while the Ontario is making its appearance among the first shippers, and will probably send in 600 or 700 tons during the season.

The bullion shipments from the old furnaces continue at a lively rate, and amount to 100 tons in the past four days. The daily output has increased somewhat, and now averages about sixteen tons, over 300 bars. An additional carload of coke has been ordered to accommodate the new furnaces, and this, together with a general increase in ore shipments, will greatly increase the teaming business hereabouts.

The effect of the new furnaces, and the certainty of an increase to 180 tons daily capacity, is quite noticeable in the stir about Ketchum, the confidence in our business men, and the general improvement of times.

It is now settled that the Philadelphia company pays more for ores than can be obtained by patronizing any other market, and the reluctance on the part of a few miners to ship in their ores can be attributed only to the want of a fair understanding. The ores of this section have been tried here and adapted to proper treatment, while they have not been sufficiently experimented upon in other markets to insure a set process and set price, or cost of reducing. Omaha prices are given in cash here, and miners are thus enabled to dispense with the bother of handling and shipping, to say nothing of the annoyance of waiting a long time for their money. Even the interest saved should be sufficient inducement for all.

The operation is the greatest in several Territories, and its present and prospective success means bottom to our mines, and permanence to our towns. It is the nucleus of a growing and industrious center, where the busy efforts of miner, miller and merchant unite in building up that which is destined to prosper and excel, in the reflections of enterprise and assiduity.

MINERALS IN THE GABILAN RANGE.—Gold and silver bearing quartz has been discovered in the Gabilan mountains, northeast of Hollister. An assay of the croppings of one of the ledges shows about $18 silver and between $2 and $3 gold; of the other ledge, between $2 and $3 silver and about $9 gold. This indicates the existence of good pay ore, and will revive the interest in the story of rich gold bearing quartz having been discovered in the mountains not far from Hollister, by a party in pursuit of horse thieves. This was in an early day, and according to current report the ledge was fabulously rich. As the story goes, one of the party was sitting down, preparing his pipe for a smoke, and discovering that he had lost his flint, he knocked off a piece of quartz that cropped up in front of him. What was his surprise to find it streaked and flecked with gold. He filled his bullet pouch with the precious ore, and the small quantity thus obtained assayed in the neighborhood of $20. Since then no one has ever been able to find the spot, although hundreds have hunted for it.—*Gilroy Record.*

COPPER IN UTAH.—Mr. Williams had just returned with samples from the O. K., the Lake Superior, the Comet and other copper mines in Copper Gulch. Of the first, owned by A. G. Campbell and others, the shaft, at a depth of 200 feet is full size in ore, oxide, carbonate, sulphuret, with a good deal of iron; may he it will average 15 per cent copper. The Lake Superior have 70 tons of selected, perhaps 20 per cent copper ore, saved in sinking 70 feet, and their waste is 5 per cent copper. These mines are within a few miles of Milford. The Comet and other Copper Gulch mines are the scene, since their consolidation, of a good deal of activity. With more work the prospect improves. If water enough can be got out of the vein for machinery and concentrating, and the copper ore continues to bear silver, this must prove a very valuable property in time. There is said to be several hundred tons of ore ready for shipment in the Star district, and good judges look for the development of some paying mines there within a short time.

Taylor District.

Taylor mining district is situated in the low hills across the valley from Ward. This camp is a lively little berg, and the sound of the hammer and saw is everwhere heard in the erection of new buildings. The town—or rather the two towns—are located on the north and south of the mines, about a quarter of a mile apart. The Monitor is working the usual number of men, extracting plenty of ore to keep the mill going, and the mines are looking better than at any time since work was commenced. To the men who control the Monitor company—Robert Briggs, W. N. McGill and W. G. Lyons—Taylor district owes its present prosperity. By their indomitable energy and perseverance they wrung wealth from the bleak and barren hills when no one else was willing to invest a dollar of capital in the enterprise, and showed to the outside world that the district had merit, and could stand on its own showing. These men made Taylor what it is, and to them, in a great measure, will be due the credit, if it should prove to be one of the best mining districts in eastern Nevada.

The Argus Company.

The Argus Company, of which Mr. Joe Carothers is manager, also have some valuable mines, which they are now developing. They have commenced the erection of a twenty-stamp mill down the valley, at a convenient point, which will probably be ready to drop stamps in three months. They are developing their mines, and, we are told, with very flattering success.

Other Mines.

Besides these there are some other valuable mines in the district, owned by poor men, who are doing all they can to develop them. The Old Brown Bull, a half-mile east from the Monitor, is one of the most promising mines in the district. It is the property of Robert Simpson, of the Ward Reflex, Wm. Pryde and Wm. Borthwick. They have several men at work, and the developments are most encouraging. We learn they have refused an offer of $15,000 for the property.

The Jennie June, owned by John Verzan and others is another location of much promise, and is being rapidly developed.

"Blanket Ledges."

The mines of Taylor are what are termed blanket ledges, which scientists tell us do not go down. It is true the Taylor mines have not been prospected to any great depth (about 75 feet being the deepest), but as far as they have gone the ore goes down and its quality improves. Ore is where you find it, and not where the scientists would have it, and the Taylor mines are as likely to reach depth as any others. One thing we predict, that Taylor district has by no means seen its best days, and that for several years to come—even if the ore does not reach great depth—it will be a paying investment for the companies operating there, and a healthy and prosperous mining town will spring up around it.—*White Pine News.*

Utah Sulphur.

Twenty-five miles east of Black Rock station on the Utah Central, on Cove creek, there are immense deposits of sulphur in almost a pure state. This has been examined and reported on by various persons, all of whom agree in regard to the extent and value of the property, while experiments have been made in digging down, and also in boaring, to a depth of thirty feet, all the way through sulphur, so that the deposit is considered as almost unlimited in quantity. One report places the amount in sight at several million tons, but be that as it may, the mines are to be worked and the product will find ready sale in the market. C. W. Scofield has purchased the property and already has his machinery at Ogden for refining the sulphur. The machinery is to be shipped to the mines, and will be capable of turning out 150 tons of pure sulphur per day. The process of refining is that of retorts in which the crude material will be placed, there to be treated by steam under a pressure of eighty pounds per square inch, which will melt the sulphur and separate it from the foreign substances. This pure sulphur will be run into cylindrical blocks weighing 200 pounds each, ready for shipping. J. T. Jeffries, who is associated with Mr. Scofield, has had much experience in the business, having erected and managed the works at Humboldt, Nevada. Nearly all the sulphur used in the United States is imported; Sicily sending us 150,000 tons per annum. Besides giving large tonnage for our railroads in taking this sulphur to market, the works will employ over fifty men. There is also another important feature about this enterprise. The mines are twenty-five miles from the Utah Central at Black Rock, while it is nearly one hundred miles to the Denver & Rio Grande. George Goss and Mr. Scofield have already arranged and contracted to build a road to connect with one of the above lines, and it is only a question of terms, as we understand, between the sulphur interest and the railroad companies, as to which route to build. Work is to be commenced within a short time on the railroad, while the sulphur refinery will soon be in operation.—*Salt Lake Tribune.*

Emery's Drill.

Several months ago, says the *Nevada Transcript*, we published a short item saying that a rock drill was in process of invention at Nevada city, which, if we were not much mistaken, would, when perfected, revolutionize quartz mining on this coast by providing a machine equally as effective as the high priced drills already in the market and at greatly reduced cost. We referred then to an invention that was being worked upon by John Lawrence and Chas. O. Barlow, proprietors of the Plaza foundry at this city, and superintendent Emery of the South Yuba mining and tunnel company. For a year past these three gentlemen have been devoting their time and experience to the subject, and after numerous disappointments it can safely be asserted that they have now accomplished what they set out to, for the invention is at last perfected. A patent has been issued in Mr. Barlow's name, and its manufacture will soon be inaugurated at the Plaza foundry on an extensive scale. Yesterday we visited the foundry, where one of them is now on exhibition and can be seen daily in operation.

It consists of an upright column carrying a sleeve and trunnion-bearing that give a universal motion by which the drill can be turned in any direction. A guide bar about 4½ feet long is attached to the trunnion-bearing for supporting the mechanism of the apparatus. It can be moved its own length by a feed-screw. On the front end of the guide bar is a screw for holding the machine in position. Attached to the guide bar is a casting that holds all the mechanism of the drill. Near the top of it is a steel mandril or arbor fitted so as to slip freely through the casting. On the front end of the mandril is screwed a chuck for holding the drill, and on the back end is a pin-wheel for turning the drill. The blow is given on the rear end of the mandril by a swinging hammer. The hammer weighs from 10 to 14 pounds and has a steel handle twenty inches long. The power is given to the hammer by means of one or more springs. The springs are compressed by an eccentric working on a traverse shaft driven by an eighteen inch hurdy-gurdy wheel inclosed in a cast-iron casing. The cam operates on a friction roller attached to a projection from the hammer handle. On the end of the traverse shaft opposite the wheel is a worm working in a worm-wheel that is attached to a pin-wheel. An endless chain works from this pin-wheel to the pin-wheel on the mandril, for the purpose of turning the drill.

The hammer can be made to strike as hard a blow as tempered steel can stand, and at the rate of five hundred blows a minute. The inventors make a strong point over other drills in the fact that this drill is by a spring pressed against the bottom of the hole when the blow is imparted, thus preventing any pulp from getting between the point of the drill and the rock. By the means of the oscillating hammer in connection with the springs a heavier blow is delivered than can be by any other means ever yet discovered.

The machine can be run by a hurdy-gurdy wheel attached directly to it, or by means of air or steam-working in a single acting trunk engine of 3½ inches in diameter by a four inch stroke. The engine is connected on the machine, the crank being attached to the same point that a hurdy would be when used.

Two of these drills have been in use for some time in the tunnel of the claim on the South Yuba river, of which Mr. Emery is superintendent. The rock there is as hard granite as can be found in the State, and the drills readily push 1¼ inch holes into it at the rate of five feet an hour. The inventors claim it will do more drilling for the amount of power used than any drill ever made.

Midsummer Ice.

Naturally formed ice in midsummer is one of the peculiarities of this peculiar country. We can offer the enquirer a winter without ice, and a summer with it, if he choose. We can give ice in July from the bowels of the earth or the summits of the mountains. We read in a Nevada exchange that Aurora has the finest ice factory in the world. In the old Del Monte workings, at a depth of 100 feet, two deserted tunnels intersect. There is a very strong draft coming through each tunnel, and meeting at the said point of intersection, lowers the temperature clear beyond the freezing point. There is quite a seepage of water from the upper workings coming down, and as fast as it drops through, at all seasons of the year, ice forms.

Quite a different thing is an ice factory in the Bear valley, about ninety miles east of Mt. San Bernardino. There is a dairy in this once famous valley, and the firmest butter is made even in summer time. A correspondent who visited the place July 24th writes:

About two tons of butter are produced in the summer season. As this is the middle of summer, they now have about a ton of the very best butter on hand. It is very cold in the valley at night, and a cup containing about an inch of water placed by your correspondent within eight feet of a blazing fire, that was kept up all night, was frozen in the morning. Snow fifteen or eighteen feet deep lies in the deep canyons of Old Grayback, a few miles away. Under these circumstances, it is not strange that the butter is well preserved.

Useful Information.

Best Time to Cut Timber.—A correspondent of an eastern journal says: "For strength, beauty and durability I have found August, September and October the best, and February, March and April the worst months to cut wood. A red maple, cut in September will keep in a round log perfectly white and sound until the next August; while one cut in March will begin to blacken and decay by the middle or last of June. This is not copied from any scientific work, but is what I have found to be a fact by many practical tests. Gray birch cut in September will keep in a good condition until the next September if left in the woods cut in four-foot lengths; while if cut in March and left in the same way it will be nearly worthless by the first of August; at least, such is the result on my land. White pine, like the red maple, keeps white much longer if cut in September than if cut in March, and is not injured by the worms as much. I have found that wood dried slowly in a low, cool place is better than dried quickly in the hot sun, even though cut in summer. May this not, in a measure, account for wood being better cut in autumn, it having the long cold winter to dry in?

How to Remove a Tight Ring.—A novel method of effecting the removal of a ring which has become constricted around a swollen finger, or in any other similar situation, consists simply in enveloping the afflicted member, after the manner of a circular bandage, in a length of flat India-rubber braid, such as ladies make use of to keep their hats on the top of their heads. This should be accurately applied, beginning, *not* close to the ring, but at the tip of the finger, and leaving no intervals between the successive turns, so as to exert its elastic force gradually and gently upon the tissues underneath. When the binding is completed, the hand should be held aloft in a vertical position, and in a few minutes the swelling will be perceptibly diminished. The braid is then taken off and immediately reapplied in the same manner, when, after another five minutes, the finger, if again rapidly uncovered, will be small enough for the ring to be removed with ease.—*Langon Gaz. des Hop.*

How Some Cooking Wines are Made.—A distinguished Frenchman, M. Scholl, breakfasting at home recently, says: I tasted a dish of stewed kidneys which I shall not soon forget. At the third mouthful I stopped. My palate and lips were on fire. "What have you put into this sauce?" I asked my cook. "Sir, as I had not the key of the cellar, I bought a bottle of Chablis at the grocer's for 1fr. 50c." "Is there any left?" "Yes, about half." "Bring me that Chablis?" "I poured a spoonful into my glass," continues Mr. Scholl, "to taste this new sort of wine. It had no taste. There was no trace even of raisins, nor of brandy. But I burned my tongue with it, and that horribly. I had the stuff analyzed by a chemist. It was merely water mixed with sulphuric acid. The maker had not even gone to the expense of a bunch of raisins or a few drops of alcohol. This composition is sold openly at 1fr. 30c. a bottle, under the name *Chablis superieur*. What must inferior Chablis be?

Is Rubber Absolutely Water-proof?—Some one asks the *Scientific American* the following question: Is it possible for water to be forced through rubber which is warranted to be water-proof, supposing that the rubber is supported by a hard substance so as to prevent its stretching; or suppose it to be stretched, how thin a piece would prevent the water from penetrating it? If it will penetrate a thin piece and not a thick one, how thick should it be in order to prevent water from coming through it? That journal answers as follows: It is probable that rubber that is warranted water-proof is water-proof under ordinary circumstances. Water under pressure will pass through many substances that are considered water-proof when no pressure is applied. You may possibly obtain pure gum that will stand considerable pressure if it is properly stayed or backed.

To Prevent Fading of Goods in Shop Windows.—A Swiss scientific journal recommends a remedy for an evil which dry goods shop keepers have long experienced, much to their annoyance and cost, namely, the fading of many kinds of colored goods, when exposed in shop windows, even apart from the direct action of sunlight. The authority referred to says that this fading or bleaching is brought about only by the white rays, which can only pass through glass that is itself perfectly colorless. It has been found that if, instead of such colorless glass, the window panes consist of glass which is slightly yellow, the fading process is prevented. Where the glass is colorless and cannot be replaced by slightly yellowish tinted glass, the desired effect may, it is said, be produced by simply giving the panes a coating of copal varnish.

Cleanliness of Sinks.—One of the most prolific causes of defilement and offensive odors in kitchen sinks and their outlets, is the presence of decaying grease. This comes from the emptyings of kettles in which meat has been cooked, in the dish water, and in the soap. The grease lodges in every crevice, and catches at every obstruction. A remedy may be found in the use of the common alkalies instead of soap—aqua ammonia in washing clothes, and borax in washing lawns and laces, and washing soda in cleaning dishes. These alkalies prevent a solid soap from forming in the sink and its pipes, and neutralize all effects of decomposing fat.

Detecting Leaks in Glass Jars.—Sarah Jane writes to the Chico *Record* as follows: Some housekeepers have bad luck in keeping fruit in glass jars, owing to an imperfect closing of the jars. I have tried this plan with much success: Upon filling the jars, I screw on the covers as closely as possible, and invert the jar upon the kitchen table. If it is not perfectly air-tight it will either leak or bubbles will rise to the surface and plainly show the imperfection, before the fruit is cold, when the cover can be tightened or the fruit heated again. By setting them with the tops up, imperfect sealing cannot be detected until fermentation takes place, and the fruit is spoiled.

A Lake of Ice.—There is a lake on the Saw-Tooth mountains, California, that probably has no equal in the United States. It is about sixty-five miles from Bonanza, and at an altitude of nearly 12,000 feet. The lake lies in a basin among the sharp crags of the snowy Saw-Tooth and in a sheet of perpetual ice. It was discovered by a party of prospectors, and named the Ice lake. The sun seems to have no effect upon it, except in places adjoining the shore. It is simply a great bowl in the hard mountain rock brimful of solid ice, upon which the rays of the sun descend with no power to penetrate.

To Produce Artificial Marble.—Reduce marble dust or white limestone to a very fine powder by grinding and sifting, mix with it intimately about one-fourth its weight of zinc oxide (zinc white) and one-eighth its weight of Portland cement, and mix thoroughly into a thick paste with a sufficient quantity of a hot aqueous solution of waterglass, containing about 40 per cent of the glass. Mold the paste under pressure while warm, and expose the molded form for a week or ten days to warm dry air before finishing.—*Scientific American.*

Cleaning Carpets.—After the dust has been thoroughly beaten out of carpets, and they are tacked down again, they can be brightened very much by scattering cornmeal mixed with coarse salt over them, and then sweeping it all off. Mix salt and meal in equal proportions.

Cleaning Files.—A cotemporary says that files may be readily cleaned of grease by holding them for a moment in a steam jet from a blow off cock.

Good Health.

What is a "Stimulant?"

In reply I would say that any poisonous or unnatural substance ingested into the living body, in amount within the ability of the vital organism to *readily* expel it, or even of the most wholesome food substance in excess of the *needs* of the organism, and yet, again, not so excessive as to depress the vital forces instead of spurring them to increased efforts to thrust it out, is a stimulant. In short, anything of an injurious nature, by reason of quality, amount, or the conditions under which it is administered, may produce stimulating effects. But the inevitable "reaction" of stimulation is depression; although, from natural causes, convalescents often make sufficient progress to overwhelm, or at least obscure, the evidence of the secondary effects.

Speaking with direct reference to the effect of alkaloids in general, Prof. Prescott says: "While a certain portion stimulates the nervous system, a large portion acts as a sedative, so that a difference in quantity of the potion causes a difference in kind of its effects." It should ever be borne in mind that the increased action under stimulation is simply the extra effect forced upon the vital organism to expel an intruder—the intruder being the stimulant itself. If this be the case, it necessarily follows that stimulants deplete, and can never replenish the vital exchequer. Instances have been noted of children who were observed to be unusually active and jubilant prior to an "attack" of diphtheria. In such case—and a true history of every case might establish this as the rule—the diphtheritic poison acts as a stimulant; nature is trying to thrust it out, and all the life forces are abnormally active. We cannot know in how many instances she succeeds in these efforts, nor yet how often her defeats are due to the administration of poisons, and food that for want of digestion becomes a poison, altogether so adding to the toxic condition that nature finally ends an evil she cannot cure. After a vigorous expulsive effort, for example, the system, temporarily quiescent, gathering fresh strength for a renewal of the conflict to dislodge the enemy, or, possibly, having already accomplished the main work, now rests in the stage preceding convalescence—is supposed to require the aid of a stimulant, and food also must be given at frequent intervals "to prevent the patient from sinking;" but, alas, this proves the weight about his neck that carries him to the bottom—"supported" to death. In comparing the stimulation of the vital organism, in sickness, to the spurring up of a tired or lazy animal to greater exertion, there is always this grand difference: The former will every time, and always, exert its entire force—that is, will exert it better, more savingly to life, without than with stimulation. "Self-preservation is the first law of nature," and no other circumstance possible to imagine better illustrates this law than the living organism in sickness.—*Cotton, Wool and Iron.*

Eggs as Food.

Eggs, at average prices, are among the cheapest and most nutritious articles of diet. Like milk, an egg is a complete food in itself, containing everything necessary for the development of a perfect animal, as is manifest from the fact that a chick is formed from it. It seems a mystery how muscles, bones, feathers, and everything that a chicken requires for its perfect development are made from the yolk and white of an egg; but such is the fact, and it shows how complete a food an egg is. It is also easily digested, if not damaged in cooking. Indeed, there is no more concentrated and nourishing food than eggs. The albumen, oil and saline matter are, as in milk, in the right proportion for sustaining animal life. Two or three boiled eggs, with the addition of a slice or two of toast, will make a breakfast sufficient for a man, and good enough for a king.

According to Dr. Edward Smith, in his treatise on "Food," an egg weighing one ounce and three-quarters contains 120 grains of carbon and seventeen and three-quarters grains of nitrogen, or 15.25 per cent of carbon and two per cent of nitrogen. The value of one pound of eggs, as food for sustaining the active forces of the body, is to the value of one pound of lean beef as 1,584 to 900. As a flesh producer, one pound of eggs is about equal to one pound of beef.

A hen may be calculated to consume one bushel of corn yearly, and to lay ten dozen or fifteen pounds of eggs. This is equivalent to saying that three and one-tenth pounds of corn will produce, when fed to a hen, five-sixths of a pound of eggs; but five-sixths of a pound of pork require about five pounds of corn for its production. Taking into account the nutriment in each, and the comparative prices of the two on an average, the pork is about three times as costly a food as the eggs, while it is certainly less healthful. *Boston Journal of Chemistry.*

The Medicinal Value of Vegetables.

On the authority of the *Medical Record*, asparagus is a strong diuretic, and forms part of the cure for rheumatic patients at such health resorts as Aix-les-Bains. Sorrel is cooling, and forms the staple of that *soupe aux herbes* which a French lady will order for herself after a long and tiring journey. Carrots, as containing a quantity of sugar, are avoided by some people, while others complain of them as indigestible. With regard to the latter accusation, it may be remarked, in passing, that it is the yellow core of the carrot that is difficult of digestion; the outer, a red layer, is tender enough.

In Savoy the peasants have recourse to an infusion of carrots as a specific for jaundice. The large sweet onion is very rich in those alkaline elements which counteract the poison of rheumatic gout. If slowly stewed in weak broth and eaten with a little Nepaul pepper, it will be found to be an admirable article of diet for patients of studious or sedentary habits. The stalks of cauliflower have the same sort of value, only too often the stalk of a cauliflower is so ill-boiled and unpalatable that few persons would thank you for proposing to them to make part of their meal consist of so uninviting an article. Turnips, in the same way, are often thought to be indigestible, and better suited for cows and sheep than for delicate people; but here the fault lies with the cook quite as much as with the root. The cook boils the turnips badly, and then pours some butter over it, and the eater of such a dish is sure to be the worst for it. Try a better way. What shall be said about our lettuces? The plant has a slight narcotic action, of which an old French woman, like a French doctor, well knows the value, and when properly cooked, is really very easy of digestion.

Two Cholera Experiments.—If experiments on animals are prohibited, experiments must be made on human beings, and in their rudest form. The contrast between such rude popular experiments on man and scientific experiments on animals was illustrated in a speech of Dr. Lyon Playfair in reference to these two kinds of experiments on cholera. The first experiment was tried on 500,000 human beings in London, who were supplied with water contaminated by choleraic discharges, with the result that 125 out of every 10,000 consumers died from the effects of the experiment. In two other experiments, made by another water company, 189 died in the first experiment, and 130 in the second, out of every 10,000. These popular experiments, on a large scale, involved the sacrifice of half a million human beings. In contrast with this may be taken the scientific experiments made upon animals by Thiersch and others. These experiments were made on fifty-six mice, fourteen of which died from the choleraic diseharges. These were not mixed with water accidentally or carelessly, as in the popular experiment, but were administered under definite conditions, and the effect watched. The results of these experiments showed that water contaminated with choleraic discharges was deadly; the water so contaminated was avoided, and an epidemic was escaped.—*Nature.*

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BUSINESS ANNOUNCEMENTS.

Machinery—Globe Iron Works, San Francisco.
Ore Concentrators—Joshua Hendy Machine Works, S. F.
Chilled Car Wheels—Steiger & Kerr, S. F.
Land for Sale—Robert Walkinshaw, S. F.
Pacific Business College—San Francisco.
Mechanics' Institute Fair—San Francisco.
Mines Wanted—Mars & Lawver, San Francisco.
Quartz Screens—Book & Wagner, S. F.

Passing Events.

The city is in a state of excitement over "Conclave week," which is the coming one. Yet even now the streets are filled with strangers, Knight Templar emblems are everywhere, flags are flying and the coming holidays are foreshadowed in all we see.

From the mining regions comes little of note other than we give in our mining summary. The season's work is now well advanced in all directions. The principal developments are going on in the Southwest and Northwest, and in the latter part of the country in particular, mining is taking great strides.

FOR the six months ending June 30, the Contention mine produced 13,625 tons ore, yielding $553,086 in bullion. Important improvements are being made at this mine. There has been no ore raised lately, but the mill is running on reserves.

THE Old Dominion Copper company of Arizona has recently purchased the claims of the Long Island company, and a 30-ton smelter. The Old Dominion has yielded 3,702,500 lbs. copper to date.

THE value of the gold and silver deposited at the United States Assay Office at Helena, Montana, for the six months ending June 30th was $246,811 in gold, and $17,048 in silver.

UPWARDS of twenty leads have been located in the Sixteen-mile country, in Meagher county, M. T., within the past two months, and prospecting is progressing lively.

Water Level for Underground Use.

The principle of the water level is of course well known, but an improvement in the construction of the apparatus has recently been made in England, where it has been adopted for leveling drifts and tunnels. One of its main advantages is, that any miner can use it, and the skilled workman with the telescopic level may be dispensed with. An engineer named Charles Bunning has devised the new instrument. It consists of two glass tubes of any convenient length, from 3 to 6 feet each, placed in a wooden upright or staff with a scale of feet, tenths and hundredths, attached, similar to an ordinary leveling staff. Each glass tube is fitted at its lower end in a brass stopcock, from which the tubes are connected by an india rubber pipe of any suitable length, from half a chain to one or more chains. The uprights holding the glass tubes can slide upwards in a frame in order that when leveling on uneven ground, a greater height may be obtained, as in the case of the ordinary leveling staff. For underground use a three-foot upright, sliding up to six feet, has been found useful in low seams, and on the surface, six feet sliding up to twelve feet is the present limit as to size; but size is only a matter of choice. To use the instrument, the india-rubber pipe and half the length of both of the glass tubes must be filled with water, taking care at the same time that no bubbles are allowed to enter, as they might occasion erroneous readings. The two uprights are placed side by side on a level surface, so that when the stopcocks are opened the water will have a full passage to both glass tubes, and will speedily come to rest. This is the only test of accuracy necessary with this instrument.

In the actual operation of leveling, one upright is placed at the starting point, and the other one is sent on in advance; the stopcocks are opened, the level of the water is read upon both uprights, and the results booked, the difference between the readings constituting the difference of level between the two places. This operation is repeated until the distance is completed, when the difference of the total additions of the fore and back sight (or rise and fall) readings will give the difference of level sought for. On leveling up or down hill, one upright will be lengthened to obtain as great a reading as possible in order to get over as much ground as is practicable. Should the instrument be lengthened to 6 feet or 12 feet, so that it would be difficult to read off the level on the index because of the height, all that is necessary is to close the stopcocks, lower the upright, and so fix the reading permanently in the tube for reading off at leisure. The advantages which are claimed for this very simple instrument as compared with the ordinary telescopic level are (1) that it is neither complex nor delicate, and therefore adapted for the rough handling of underground usage; (2) that unlike the telescopic level, no plate screws have to be turned to prepare it for reading, and the use of the water level is so easily learned that it may be placed in the hands of overmen, firemen, or deputies; (3) that the instrument is perfectly accurate, for when once the stopcocks are opened no skill, practice, or experience is required to make the water follow the law of nature and find its own level; (4) that a considerable saving of skilled labor in leveling is thus effected; (5) that it is superior to other levels, in that it can be used round, over or under any obstacle as easily as in a straight line; and (6) that the small cost of the instrument as compared with the telescopic level is a great argument in favor of its adoption.

A new automatic steam brake to prevent overwinding of cages in shafts is in use in England. At a recent trial the engine was set in motion the wrong way. When the cage was pulled up 2 feet 8 inches it came in contact with a lever, which released a lock, and by a simple contrivance instantaneously cut off the steam from the engine, and at the same time allowed it to pass into a steam brake cylinder and applied a powerful brake, which at once arrested the motion of the engine. The whole of the time occupied in winding the cage up, shutting off the steam, lowering the cage on the "keps," and the pit being put in working order again, only occupied about 30 seconds.

SEVERAL gentlemen of Billings, M. T., left one night last week on some secret expedition to some remarkably rich gold discovery recently made by their prospectors. The object of the midnight journey was to dodge some parties who intended to follow them.

Magnetic Iron Sands.

As a general thing mining for gold in the beach sands of the California coast has not been profitable. There have been isolated cases where it has paid well, but taken altogether there has not been much profit for the work expended. It has long been thought it would be profitable to work the beach sands for the iron they contain. The wash of the sea and the whirl of the winds concentrates the heavy magnetic iron in masses, and it is more or less abundant at many points on the ocean beaches. Various attempts have been made to utilize these sands for their iron, but no success has been made of it. Last year there was talk of a company about to make steel direct from the sands, but nothing practical has come of it. Not only in this country, but in Canada, New Zealand and elsewhere, many attempts have been made to get the iron from the sand at economic rates.

Machinery in which magnets are employed is said to have successfully separated the iron, and in Canada one got by this process an iron sand with 72 per cent metallic iron. Now comes a New Jersey man who has invented a method of making bar iron out of the sand and he is about to introduce the system in Ohehunga, N. Z. The process is as follows: The sand as it is found is brought to a separating machine, where it is separated by magnets. The sand contains, after being cleaned, about 70 per cent pure iron, about 5 per cent impurities, and a little titanium. From the separating machine the sand is put into a furnace 32 feet high and of 7 feet diameter. In the furnace are a number of retorts, into which the sand was introduced and heated red in order to expel the oxygen. From these retorts the iron sand is brought into a common puddling furnace, which is below the retorts, and whose gases are employed for heating the retorts, then here it is worked into ingots. The proprietors of the works are of the opinion that the costs of this process are considerably cheaper than production of pig iron.

Arizona Mines.

We had a conversation this week with Mr. C. H. Aaron, who has just returned from Pinal, Pioneer district, Arizona, and we should judge the region in question was not in a very promising condition. There are some 5,000 locations in the district, but only one paying mine—the Silver King—and that passed its dividend this month. The Eureka mine was considered one of the best properties in the district, and has been purchased by Eastern people. It is now being worked. They have a five-stamp mill known as the "76." The present work will prove the worth of the mine. In a mine close to the Silver King, called the Monarch of the Sea, they have recently struck ore reported to be good. They have been trying to find the King body of ore, but what they have struck is reported to be of a different character.

Another of the mines there, sometimes called the "Bilk," properly the Mowry, sunk 800 feet, but found no ore. They are also looking for the King ore body. It appears to be a characteristic of the mines so far that if they have good ore on top it does not go down.

The Pinal Con. smelting works have stopped work and discharged a lot of men. Some say this is due to lack of ore; others say they will build another furnace and start again.

There are about 600 or 700 men in the district. The Silver King has about 100 men working in the mine and 25 in the mill. Most of the miners are holding their claims to sell, and not much prospecting is being done except on claims already discovered.

The little smelting furnace put up in Rogers district was a failure, partly for the reason that mule power did not answer for blowing. A small engine is to be put up for the blowers. The furnace—an adobe—was too small, also.

The Hastings mine, at Queen creek, has a splendid gold mill. They stopped work some months since just as the mine began to pay, but are now resuming operations.

Mr. Aaron thinks highly of the future prospects of Arizona. He considers it much superior to Nevada both as a mining and agricultural country.

INFORMATION WANTED of the whereabouts of A. Morrison, formerly of Rye Patch, Nevada. Address this office.

Laying Dust in Mines.

It is very well known that impalpable molecules of flour, a substance not inflammable of itself, give rise to spontaneous combustion, and many persons believe that the chief cause of colliery explosions must be sought, not in the spontaneous production of carburetted hydrogen, but in the minute particles of coal dust which penetrate the gauze of the safety lamp become incandescent and throw off sparks outside the lamp, thus igniting the fire-damp. It is now suggested as a means of prevention to employ jets of steam, which, owing to their expansion, would penetrate into all corners of the mine and deposit the dust. Nothing is said of the effect of this steam on the miners.

A professor of the Royal Athenaeum, Antwerp, suggests a method of applying this steam. The steam pipe for laying the dust, which need only be the diameter of the little finger, is to be put in communication with the boiler on the surface, and there provided with a stop-cock as well as at the working face, and telegraphic communication is to be established between these two points, in order that the quantity and pressure may be regulated from time to time, according to requirements. A pipe of one centimeter (less than one-half inch) in diameter would give enough steam for an ordinary working place, because a given volume of water, turned into steam at atmospheric pressure, expands 1,700 times; and this steam, when allowed to escape freely into the air, would become further expanded by 100 times, so that it would fill a space of 100 cubic meters (3,530 cubic feet), and in condensing lay the impalpable dust. It would also moisten the atmosphere, and probably separate the carburetted hydrogen into its component parts, thus rendering it less inflammable, and so prevent an explosion. M. Spanogbe's experiments are not complete as to this portion of the subject; but he argues that, inasmuch as the combustion of lighting gas is not so perfect during foggy weather as it is when the atmosphere is free from moisture, the pressure of steam in the air of the mine must certainly exert a favorable influence in preventing fire-damp explosions.

Structure of Minerals.

Properly speaking, the cleavage of crystals is part of their structure. The chief varieties of structure as distinct from cleavage, are called:

Fibrous.—Made up of thin, straight, or curved fibers lying side by side. They have often a silky luster. Satin spar is a name given to fibrous varieties of gypsum and aragonite, in which this silky luster is very marked.

Reticulate.—The same as fibrous, but the fibers crossing each other irregularly in all directions, as in the mineral called mountain leather.

Stellate.—The fibers radiating from centers in all directions, as in stilbite and some varieties of gypsum.

Radiate or Divergent.—The fibers diverging from each other, but not producing complete stars, as in antimonite and pyrolusite.

Lamellar.—The mineral appearing to consist of flattened leaves or lamina, as in bronzite. The lamina may be either flat or curved.

Foliaceous or Micaceous.—The leaves being very thin, as in mica and selenite.

Granular.—Apparently made up of minute grains, as in chalk or kaoliu.

PROSPECTORS returned from the Quijotoa mountains, Arizona, are very enthusiastic over a rich strike there. The owners are taking ore from the surface to ship to Benson, and the mine has every appearance of being one of the largest and richest in the Territory.

THE owners of the Grand Central mine in Arizona expended $400,000 before getting back a dollar. There is said to be 20 miles of underground to work in this mine. It is yielding from 95 to 100 tons of ore daily, and a 35-stamp mill is in constant operation.

HORSE-POWER HOIST.—The types made us say recently that the Baker horse-power hoist would raise a loaded cage twelve feet per minute, when it should have read 120 feet per minute.

THE lead in the Green mine, Tuolumne county, pinched out or was lost awhile, but last week, by changing direction of work, it came in again, and is yielding very rich ore.

THE completion of the tunnel will add considerably to the life of the Ontario mine.

Blasting in Mines—No. 4.

Conditions of Disruption.

The conditions under which disruption of rock may take place should be carefully considered. Suppose a block of unfissured rock detached on all sides, as shown in plan, Fig. 1, and a bore hole placed in the center of this block? If a charge be fired in this position, the lines of rupture will radiate from the center towards every two, or towards all four of the unsupported faces of block, because the forces developed will act equally in all directions, and the lines of rupture will be those of least resistance.

Evidently this is the most favorable condition possible for the charge, since the rock offers an unsupported face on every side, and it is evident that the line of rupture must reach an unsupported face to allow of dislodgment taking place. Suppose again, as shown in Fig. 2, the block to be unsupported on these sides only, and the charge placed at *h*. In this case, the lines of rupture may run to any two, or to all three of the unsupported faces; and hence this will be the next most favorable condition for the action of the charge. The greatest useful effect, however, will be obtained in this case by placing the charge further back at *h'*, when the lines of rupture must necessarily run to the opposite faces, *b c*, and consequently the whole of the block will be dislodged.

Assume another case, says Andre in his "Coal in which the rock is unsupported only on two sides, as shown in Fig. 3, and the charge Mining," from which these engravings are taken, placed at *h*. In this case the lines of rupture must run to each of the unsupported faces, *a b*. Thus it is evident that this condition, though still a favorable one for the good effect of the charge is inferior to the preceding.

As rock is never homogenous in composition or uniform in texture, its lines of rupture, which, as before remarked, will be those of least resistance, many reach the faces at any point as at *m*, *n*, *m' n'*, or any point intermediate between these. But it will be seen that the useful effort will be greatest when these lines, radiating from the charge, make an angle with each other of 180 degrees, or in other words, run in directly contrary directions, and that the useful effect diminishes with the angle made by these lines of rupture.

Suppose again the rock to be unsupported upon one side only, as shown in Fig. 4, and the charge placed at *h*. In this case the lines of rupture must run to the face *a*, and the condition must therefore be considered an unfavorable one.

As in the preceding case, the useful effect will depend upon the angle made by the lines of rupture, *h m* and *h n*, which angle may be very small, and which must necessarily be much less than 180°. A greater effect may be obtained under this condition by firing several charges simultaneously. If, for example, we have two charges placed, one at *h* and the other at h', and fired successively, the lines of rupture will run in or near the directions, *h, m, h, n, h' m', h' n'*, and the portion of rock dislodged will be *m h n h' n'*. But if these two charges be fired simultaneously, the lines of rupture will be *hm, ho, h'o, h'p'*, and the mass of rock dislodged will be *m h h' n'*.

Simultaneous firing is in this way productive of a greatly increased useful effect in numerous cases, and the mining engineer and quarry man especially will do well to direct their attention to this source of economy.

There is yet another care to be considered, in which the conditions are still more unfavorable. Suppose two unsupported faces at right angles to each other, and the charge placed at *h*, as shown in Fig. 5. In this case the lines of rupture will run to the two unsupported faces; but as these lines must necessarily make a very small angle with each other—for the length of the lines increase rapidly with the angle—the useful effect will be less than in the last case. It follows, therefore, that this is the most unfavorable condition possible, and should be avoided in practice.

In the foregoing considerations the holes have been assumed to be vertical, and for this reason the unsupported face which is perpendicular to the hole, that is, the face into which the hole is bored, has been neglected. For it is evident that, under the conditions assumed, the lines of rupture cannot reach this face, which therefore has practically no existence. Suppose, for example, a bore hole placed at *h*, in Fig. 6, and the rock to be supported at every side except that at right angles to the hole. The forces acting perpendicularly to the direction of the bore hole are opposed on all sides by an infinite resistance, and consequently the line of the hole becomes that of least resistance. Hence in this case either the tamping will be blown out, or if the forces developed are unequal to the work, no effect will be produced beyond a mere enlargement of the hole at the base.

This is a case of frequent occurrence in practice, and it becomes necessary to adopt measures for making this unsupported face available. Evidently, this object can be attained only by so directing the bore hole that a line perpendicular to it may reach the face—that is, the line of the bore hole must make with the unsupported face an angle less than 90°. The direction of the bore hole is shown in Fig. 7, which may be regarded as a sectional elevation of Fig. 6. In this case the lines of rupture, which will run similarly to those produced in the case shown in Fig. 4, will reach the unsupported face at *b*, and the length of these lines, and consequently the depth of the excavation for a given length of bore hole will depend upon the angle which the latter makes with

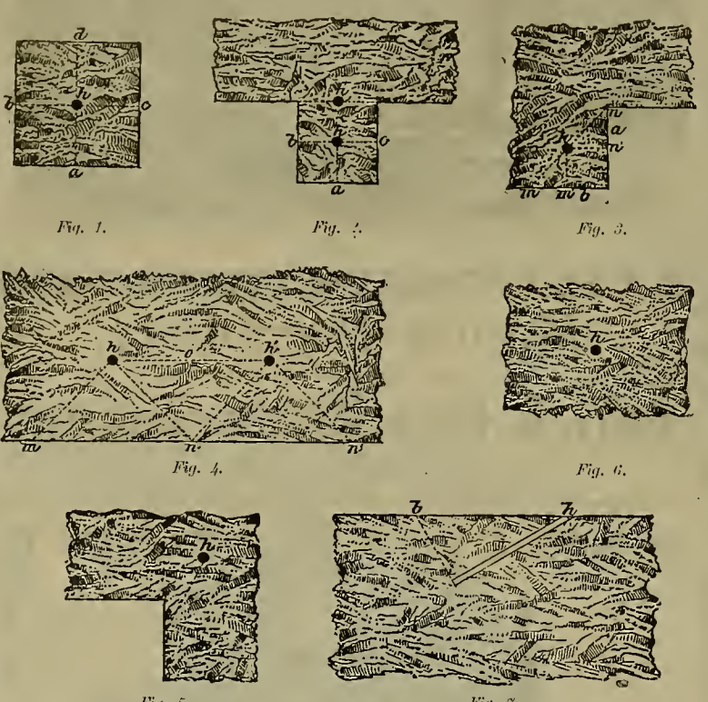


Fig. 1. Fig. 2. Fig. 3.

Fig. 4. Fig. 6.

Fig. 5. Fig. 7.

CONDITIONS OF DISRUPTION IN BLASTING ROCK.

the face. This mode of rendering a single exposed surface available is called "angling the holes," and it is generally resorted to in shaft sinking and driving headings. The conditions involved in "angling" are favorable to the action of strong explosives.

Riverside Raisins in Boston.—California products are constantly winning wider fame. Mr. George H. Tullerton, of Brockton, Mass., on a recent visit to Riverside, purchased samples of raisins made by Messrs. Combs & Cutter, and, taking them East, exhibited them at Boston to wholesale and retail dealers. He reports to the Riverside *Press* that the fruit was received with exclamations of surprise, and then these words:

"I never saw such raisins; were they grown in California?" "Yes, sir, in Riverside," is the reply. "Well, sir, if California can produce such raisins as those, we want them. They are finer than the Malaga." "That is saying a great deal," I reply, and the answer comes: "But, man alive, it's a fact. I'll sell those fancy packed raisins for five dollars a box, any time before New Years, and can get three dollars for such 'London Layers' at any time." One extensive dealer in raisins in Boston has had one of the samples on exhibition at his place of business, and has taken every opportunity to exhibit the raisins to wholesale dealers in the city. They say, "They are the finest raisins that ever came to Boston." Their keeping qualities are found to be superior to the Malaga.

A Guibal ventilating fan 36 feet in diameter with a velocity of 50 strokes a minute, engine 36 inches in diameter, drives 60,000 cubic feet of air a minute down a mining shaft.

Kaolin.

Kaolin, or porcelain clay, is an exceedingly valuable substance, and the miners of this coast have prospected for it more or less for years. They frequently think they have found it, but usually bring in infusorial earth instead. Scarcely a fortnight passes but some miner brings or sends us infusorial earth under the impression that it is kaolin. Specimens of the material are in the State Mining Bureau from Kern and Tuolumne counties, but by far the greater part of the deposits are of the diatomaceous earth character, and not kaolin. The two substances bear a close resemblance apparently, but are very different in their characteristics. Now we are told a large deposit of the pure kaolin has been found in Nevada county, and this week received the following letter on the subject:

Editors Press:—Dated as far back as 1871, I remember articles in your much esteemed Press and paper, and among other noted mining interests of California, looking to the discovery of the much sought for kaolin which you or your contributors supposed might be found in this region.

I have made many searches and researches on this coast for the pure article of kaolin, but not until within a few days have I made the wonderful discovery that it is even within our midst, *pure*. On the grounds of Mr. J. W. De Golia, situated in Grass Valley township, California, I find as good a quality of kaolin as I ever saw in England, where I first worked it and became acquainted with its merits, or in Merwinsville, Connecticut, or Cornwall, Litchfield county, same State, where I put up buildings and mills. From these last mines I worked five tons, which were sent to the Exposition, Paris, France, from this country, and received the premium there in 1865. I do not think they have a better quality of kaolin in the great works at Trenton, New Jersey, where it is supposed the best article in imitation (or better than imitation) of French and China ware is manufactured in this country.

This body of kaolin, in its purity, now exists in large beds upon the grounds of Mr. De Golia, within a half mile of the Nevada City Narrow Gauge railroad, in Nevada county. It has the advantage of carrying with it feldspar, or petunse, which is necessary to the production of clear porcelain.

Correspondence with those manufacturing this article of clear porcelain is desired.

I will state that this is the first pure article of kaolin with its necessary adjuncts for working, and its close connections for transportation, discovered in large quantities on this coast. I have the first United States patent issued for preparing and reducing kaolin for the production of pure, white, clear porcelain.

T. W. Moore.

Gold Flat, Nevada City, Cal., April 11th.

D. O. Mills has formally presented to the Capital Commissioners for the State of California a magnificent piece of statuary representing Columbus at the Court of Queen Isabella. It is nine feet high, and cost $35,000.

The Vatican has sent instructions to bishops in Spain to abstain from sharing in the present political agitation in that country.

Manual of Assaying.

There is a constant demand for a manual of assaying adapted for the use of miners, prospectors, mill men, and such persons as have not the chemical knowledge to undertake the analysis of ores. A simple book is what is needed, and that badly. Mitchell, of course, covers the want, and a great deal more; but the price is very high.

We have received this week a "Manual of Assaying," by Walter Lee Brown, published by Jansen, McClurg & Co., of Chicago. The book is comprised in three divisions. The first describes and illustrates all apparatus required, as sampling and pulverizing implements, balances, furnaces, tools, etc.; it also describes the re-agents, and how to prepare and test them. The whole of the second part is devoted to the assaying of the ores of the four metals mentioned, but principally to those of gold and silver. The third part, or appendix, includes many special processes, as the assay of gold and base bullion, amalgamation, pan and chlorination tests, copper analysis, testing of minerals, etc. For reference, there are here included lists of the minerals of gold, silver, copper and lead, a list of books bearing on geology, mineralogy, metallurgy, assaying, etc., and various useful tables of weights.

The book is intended as a simple, practical one, to contain all information necessary to enable any one, with a little practice, to assay ores that are supposed to contain gold, silver, copper, or lead. Mr. Brown is an analytical chemist and assayer, and has given the mining community a really useful little book—costing but $1.75—yet there are some defects. For this coast, too little account is given of the crucible assay, which is more used than scorification. What is given conveys the impression that the writer knows but little of it. References and quotations are quite too frequent, as if the author did not feel sufficient confidence in himself to give facts on his own responsibility. The quotations on page 155, credited to Ricketts, belong to Mitchell, from whom evidently Ricketts took them, for they are verbatim.

No man, unacquainted with the operation, could make an assay of gold by chlorination from the direction given in this book. The author gives a determination of the "reducing power of certain ores," but says nothing about the oxidizing power of certain other ores, which has puzzled many a student. This defect is in all the books. The utility of the table of assay ton equivalents is not very clear. The list of books on subjects more or less connected with assaying is a useful one. The description of the apparatus used in assaying is good and clear. The illustrations are well executed also. The author has faithfully endeavored to carry out his idea of a plain, practical work. On the whole, the book does not quite fill the bill of a hand-book of assaying gold, silver, lead and copper in the most satisfactory manner, yet it is the best attempt at a simple book on the subject for the use of the class it is intended for we have yet seen. No one will be a loser who possesses it, if he is at all interested in the subject. It contains 318 pages, and is fully illustrated.

Long Tom District.—This district is in Kern county, in this State, about thirty miles northward and westward from Bakersfield. Mr. Aaron, who lately visited the district, informs us that the Long Tom mine, which has been worked many years, is just at present short of ore, and the working force has been reduced. All the gulches in the vicinity were long since worked out, and many quartz veins are being prospected in the vicinity, and many of them promise very well. On the hills about they occasionally find pieces of gold of considerable value, indicating rich deposits near by. Of course the miners are trying to find the original deposit.

The German government will send a scientific expedition to Egypt to examine into the origin, nature and cause of the cholera now prevailing there, and to ascertain the best measures to prevent the spread of the disease.

The new steamer *Mariposa* has just made the quickest trip on record between Honolulu and San Francisco. She was five days twenty hours going down, and six days eight and one-half hours returning.

Los Angeles is to have a free postal delivery from the first of October next.

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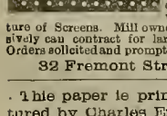
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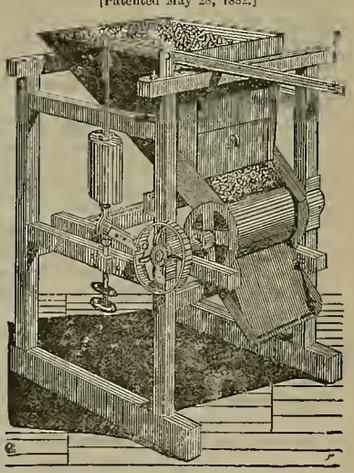
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California Inventors

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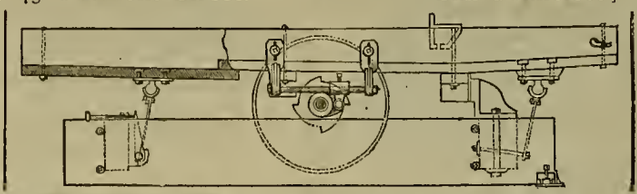
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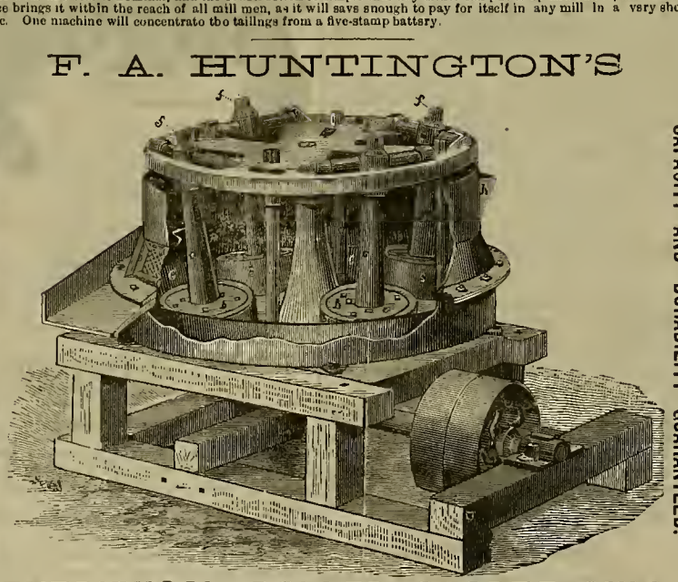
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4. It runs with one-third the power per ton of ore crushed.
5. The wear is less than that of stamps.
6. The wearing parts are easily duplicated.
7. It has a much better discharge, and leaves the pulp in better condition for concentrating.
8. It is a better Amalgamator, saving fully nine-tenths of the gold in the mill; the balance can be saved on plates in the usual manner.
9. It is continually crushing, not like the stamp, using power to suspend it in air ninety-nine one-hundredths of the time, and the balance making a thundering noise, and accomplishing *comparatively* small results. It is as far in advance of the stamp mill as the present method of making flour with improved rolls is over the Indian's mode of crushing corn in a stone mortar.

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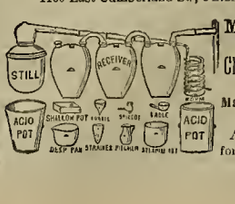
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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING AUGUST 7, 1883.

282,607.—HASP LOCK—J. C. Boggs, Auburn, Cal.

282,839.—MAGAZINE GUN—J. M. & M. S. Browning, Ogden, U. T.

282,700.—DISCHARGE PIPE FOR DREDGERS—J. M. Buckley, Portland, Or.

282,701.—GRADING AND LEVELING MACHINE—J. M. Buckley, Portland, Or.

282,705. GRAIN SEPARATOR—Wm. Crane, Castroville, Cal.

282,863.—PROCESS OF GRINDING AND APPARATUS FOR AMALGAMATING ORES—Dow & Chandler, Virginia, Nev.

282,710.—RUBBER SOLE AND HEEL FOR BOOTS, ETC.—F. Ephraim, S. F.

282,623.—LOCOMOTIVE REFLECTOR—Frost & Cartwright, Portland, Or.

282,880.—CULTIVATOR BLADE—L. D. Gavilt, Los Angeles, Cal.

282,517.—DOOR LOCK—J. J. Hesling, S. F.

282,638.—TOY DART—J. E. Hooker, S. F.

282,641.—SKYLIGHT—P. H. Jackson, S. F.

282,561.—LIFE PRESERVER—C. Leduc, S. F.

282,560.—CARPENTER'S BEVEL—C. E. Overend, S. F.

282,765.—CHUCK—J. A. Peer, Grass Valley, Cal.

282,667.—GLOVE—R. Raymond, S. F.

282,568.—FANNING MILL—T. R. Rosier, San Jose, Cal.

282,670.—TAILOR'S MEASURE—S. C. Rugland, S. F.

282,671.—CUTTER FOR WOOD-WORKING MACHINES—A. I. Sanborn, S. F.

282,686.—ROCK DRILLING MACHINE—Thomas Threlfall, S. F.

282,687.—ROCK DRILLING MACHINE—Thomas Threlfall, S. F.

282,592.—DEVICE FOR UNSHIPPING MASTS—J. F. Walthour, S. F.

282,811.—SLEIGH—Geo. E. Watson, Bannock City, Montana Ter.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

CUTTER FOR WOOD-WORKING MACHINES.—A. I. Sanborn, S. F. No. 282,671. Dated Aug. 7, 1883. In the ordinary construction of the cutters to be attached to the revolving cutter-heads of wood-working machines, they are so formed as to be bolted upon the back side of the cutter-head, relative to its direction of revolution, and the cutting edge projects to the front, so as to make what may be termed a "lifting cut." In one case the cutter has been so formed that the cutting edge stands in a lateral, oblique relation with the shank, so as to make the part which cuts deepest the last to cut, but it is fixed to the head in the manner above described. Mr. Sanborn's cutter consists of a steel plate, or series of plates, bent to the shape of the molding, or the parts of it to be cut, these plates being bolted or secured to the cutter-heads so as to project backward from the revolving head. Instead of being bolted upon the back side of the cutter-head, relative to its direction of rotation, so that the cutter projects forward in the usual manner, the cutters are bolted to the front side and the cutting portion projects backward, so that a drawing cut is secured, and the work will be smoother and more perfect.

LIFE PRESERVER.—Constant Leduc, S. F. No. 282,651. Dated Aug. 7, 1883. This invention relates to a new and useful life preserver as an article of manufacture; and it consists of a suitable band, belt, mattress or garment constructed wholly or in part of dried stalks or stems of what is known commonly as "tule." This is a large rush or sedge of the order *Cyperaceæ*, and known scientifically as *Scirpus validus*. It grows in marshy places, and, while found in several parts of the U. S., is particularly abundant in California, where it grows to a great height, and its stems attain considerable diameter. These stems are very pithy, and when dried become light and buoyant, so they are adapted for the purpose of life preservers. They are not of such a loose texture as to become water-soaked and will remain on the surface of the water an indefinite length of time. The abundance, lightness and economy, make this substance useful in place of cork. The inventor patents a new article of manufacture of "a life preserver made of bunches of the dried stalks of tule, each bunch having a central core of light wood."

GLOVE.—Reuben Raymond, S. F. No. 282,667. Dated Aug. 7, 1883. The object of this improvement is to provide a glove in which the longitudinal finger-seams usually found on the front or working side of the glove are thrown to the rear sides of the finger. A further object is to provide for certain novel cross-seams between the under and second fingers, and between the small and middle fingers. The advantages expected from these improvements are economy in cutting, and comfort and strength in the glove. To obtain these ends, the invention consists in a peculiar piece let into the back of the glove, and forming the back-center of the body of the glove, and the back of the second and middle fingers, and novel fourchettes forming the front and sides of the middle and second fingers, and having a lap and point whereby they are stitched to the main body of the glove and form cross-seams between them and the index and small fingers.

SKYLIGHT.—Peter H. Jackson, S. F. No. 282,641. Dated August 7, 1883. This improvement in skylights for lighting purposes consists mainly in a means for making tight joints where the parts meet, and providing against the effects of expansion and contraction, which loosen the joints and make cracks to leak and admit rain or wet. The class of lights to which the invention is shown as applied in the patent, is those in which frames of iron are supported upon curved or arched ribs, these frames having sockets to receive the glass in the usual manner. Mr. Jackson has made a specialty of this class of work, particularly in lighting cellars, basements, sidewalk spaces, etc. Many specimens of his work exist in this city.

CIGAR AND CIGARETTE HOLDER.—Joseph Fletcher, Livermore. No. 281,183. Dated July 31, 1883. This improvement in cigar and cigarette holders consists of a single piece of wire, so bent as to have a spring at one end, and erossing, clasping ends at the other, the extreme points being bent back to form hooks. The object of the invention is to provide a simple device for holding cigars or cigarettes, whether in the hand, or laying on the table; and in the latter case to support the lighted end above the surface of the table.

HASP LOCK.—John C. Boggs, Auburn, Placer Co. No. 282,607. Dated August 7, 1883. This invention relates to a new and useful improvement in that class of hasps that are capable of being extended longitudinally to adapt them to their staples with ease and accuracy, and it consists in pivotiug the lock pin to the sliding portion through a slot in the stationary portion.

PURIFICATION OF ORES BY AIR BLAST.—In the neighborhood of Genolhac there are large quantities of ochreous earth coutaining some threads of galena, but in no instance does the proportion of lead exceed seven per cent. This ore is consequently very poor, but is so abundant that attempts have been made to enrich it by the ordinary processes of washing. These attempts having failed, it occurred to the engineers to try air, which was forced through three superposed metallic cloths, with meshes of four, five and ten millimetres (.157, .197, .394 inches) respectively. The air being thus perfectly divided reaches a rectangular box, at the extremity of which a hopper distributes regularly the dried and pulverized materials which it is desired to classify. The worthless portions being the lightest are easily driven off by the blast, while the leaden particles being heaviest, are carried to the bottom.—*Cotton, Wool and Iron.*

THE best preparation of iron a doctor can prescribe is Brown's Iron Bitters, because it does not injure the teeth as other iron medicines will.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties conuected with the interests specially represeuted in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and exteuding its influence in the cause it faithfully serves. Subscription rate, $4 a year, in advance. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times,) by turning a leaf.

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Should this paper be received by any subscriber who does not want it, *or beyond the time they intend to pay for it*, let them not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent.

In the Whitehaven (England) collieries which have been worked since 1667, from the "main-baud" workings underground to the lamp-inspecting station is three miles.

AT the Rainbow mill, in Sierra county, last week, for a run of five hours, $5,000 was taken from the plates alone, the battery not being cleaned up.

THE amount of gold bullion deposited at the Denver Assay Office for the six months ending June 30th was 28,115 ounces, valued at $463,900.

BOUND VOLUME OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce, and valuable for future reference and library use.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

G. W. MCGREW—Santa Clara county.
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This will be the most comprehensive Exposition yet held in this State of

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A GRAND CONCERT

And other extra attractions each afternoon and evening.

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Members of the Mechanics' Institute, in good standing, are entitled to double and single season tickets at half rates.

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Full information will be given and sent on application to the Secretary, 31 Post Street.

P. B. CORNWALL, President.

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One 20-inch bore engine, 24-inch stroke; one 18-inch bore engine, 40-inch stroke, Meyer's cut-off; one 14-inch bore engine, 36-inch stroke, Meyer's cut-off; two 12-inch bore engines, 30-inch stroke; two sets heavy pumping gear, with bob and connecting rod irons, etc.; 450 feet of 16-inch pump pipe of ½-inch iron, heavy flanges; besides other mining and milling machinery.

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J. M. LAKENAN,
Grass Valley, Cal.

Cheap Ore Pulverizer.

There is for sale in this city, by I. A. Heald, American Machine and Model Works, 111 and 113 First St., a Rutherford Pulverizer, an improved revolving barrel crusher, which was only used a few times and is as good as new. It will be sold very much below cost, and miners who are in need of such an appliance for a small mine will do well to make inquiries concerning it. It is suitable for a pulverizing mill for powder or other substances. Reference as to above can be had upon applying to this office.

Stock and Grain Land.

Parties wishing to purchase good stock raising lands unaffected by severe drouths, will do well to address the undersigned. The lands can be purchased cheap, in lots from 100 to 2,000 acres. It is partly low table and rolling land, partly clear and level. Good for vine and fruit raising. Will raise vegetables and all kinds of grain. Crops certain every year. Near town and a $10,000 public school house. Price, $3 to $5 per acre. Good local market for fruit, vegetables, grain, poultry and dairy produce. Address the proprietor,

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MINES WANTED.

Two California Quartz Gold Mines for customers. Must be sufficiently developed to show value, and submitted with reports and 90-day bond.

MARS & LAWVER,
45 Merchants' Exchange, San Francisco.

REFERENCES—J. B. Haggin, Louis A. Garnett, John J. Valentine, Anglo-Californian and Donohoe, Kelly & Co.'s Banks.

Mining Companies.

Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company.

San Francisco, August 2, 1883.

At a meeting of the Board of Directors of the above named company held this day, Dividend No. 57, of twenty-five cents (25c.) per share, was declared, payable MONDAY, Aug. 13, 1883, at the Farmers' Loan and Trust Company, in New York, or at the office in this city.

WILLIAM WILLIS, Secretary.

OFFICE—Room No. 29, Nevada block, No. 309 Montgomery street, San Francisco, Cal.

ASSESSMENT NOTICE.

Seaton Gold Mining Company.—Location of principal place of business, San Francisco, California; location of works, Drytown, Amador county, Cal.

NOTICE is hereby given that at a meeting of the Board of Directors, held on the 31st day of July, 1883, an assessment (No. 9) of eight cents (8c.) per share was levied upon the capital stock of this corporation, payable immediately in United States gold coin, to the Secretary at the office of the Company, Room 6, 528 California St., San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 5th day of September, 1883, will be delinquent and advertised for sale, at public auction, and unless payment is made before, will be sold on Thursday, the 27th day of September, 1883, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. A. MARTIN, Secretary.

OFFICE—Room 6, 528 California Street, San Francisco, California.

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SCIENTIFIC PRESS

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320 ACRES FIRST-CLASS VINEYARD LAND one mile from Madera Railroad Station, Fresno county; irrigated from Fresno Canal; 120 acres planted in choicest foreign grape vines 1½ years old—Gorlo Blanco, Charbono, Burger, Zinfandel, Folle Blanche, Trousseau, Matero, Verdal and Muscatel.

Also, Orchard of 1,000 Apricot Trees, and Nursery with 250,000 Prime Grape Cuttings.

The property could not be in finer order, and when the vines come into bearing, should pay for itself in two or three seasons. ☞ PRICE, $20,000.

Agricultural, Grazing, and Timber Lands, improved Farms, Orchards, and Vineyards for sale in various counties throughout the State.

☞ Circulars on application. For full particulars, apply to

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438 California St., San Francisco.

FOR SALE.

A New 14x30 Inch

CORLISS FRAME ENGINE

—WITH—

Myers' Cut-Off.

APPLY TO

SAVAGE & SONS,
143 Fremont St., - - San Francisco.

Current Frauds.

The Sophomores of the Michigan Agricultural College continue their useful work in analyzing materials offered to the public under specious names and with wonderful claims—materials which are often worth but one-tenth of the price asked for them, and consequently bring much ill-gotten gain to those who manufacture them. It will be a public benefit to have all such nostrums stripped of their false colors, and the public robbery stopped. In the last issue of the *College Speculum*, Prof. Kedzie gives a group of the results which his students obtained by analysis. We quote as follows:

ROUGH ON RATS.—"Rough on Rats.—Poison. Do not die in the house. Made only by E. S. Wells, chemist, Jersey City, N. J. Is entirely new, differing from anything before introduced. 'Traps, arsenic, strychnine, phosphorous, and other pastes and poisons fail to completely clear them out,'" etc.

This is simply white oxide of arsenic, or old-fashioned "ratsbane," colored with a little lamp-black. It is contrary to the law in Michigan to sell this material without distinctly labeling it *arsenic*. Cost of a box 1½ cents; price 25 cents.

INSTANTANEOUS HAIR DYE.

Chloride of silver dissolved in ammonia water. Cost 5 cents; price 50 cents.

BAZIN'S DEPILATORY POWDER, for removing superfluous hair.

Four-fifths sulphide of calcium and one-fifth red sulphide of arsenic. (Realgar.) Costs 10 cents; price 50 cents.

ORIENTAL CHARM, or magical beautifier, by T. Felix Gourand, New York.

One ounce calomel in eight ounces of water. Cost 10 cents; price $1.50.

CREAM OF ROSES, by H. C. Foreman, Chicago, Illinois.

One ounce carbonate of lead in six ounces perfumed water, with a small vial of red ink. Cost 10 cents; price 75 cents.

CHAMPLIN'S LIQUID PEARL.

Half ounce of oxychloride of bismuth in four ounces perfumed water. Cost 12 cents; price 50 cents.

CAMILLE'S SNOW DROP.

Chalk and carbonate of bismuth. Cost 5 cents; price 25 cents.

MRS. ALLEN'S HAIR RESTORER.

One ounce precipitated sulphur suspended in rose water. Cost 10 cents; price $1.50

A NEW DEPARTURE OF $0.25 for 39 cents, by J. D. Henry, Buffalo, N. Y.

Five small packages (of about ten grains each) of aniline colors. Cost ½ cent; price 39 cents.

DYKE'S BEARD ELIXIR, from U. B. and N. Co. Palatine, Ill.

One-quarter ounce of flowers of sulphur, a few grains of borax, a few grains of powdered cardamom seeds and cinnamon bark, and a small quantity of coloring matter. Cost 1 cent; price 25 cents.

News in Brief.

IT IS said Cetewayo is now on his way to Pietermaritzburg.

THE Nile is rising rapidly, and the destruction of the crops in Egypt is feared.

THE combined weight of six large watermelons sold at Los Angeles last week was 453 pounds.

THE Mayor has counted the cash in the San Francisco treasury, and found it all right—$730,109.35.

THE Mexican Central railroad is now completed 168 miles south of Chihuahua, making a total of 388 miles completed.

RETURNS from seventy out of eighty-eight counties in Ohio show that the Scott liquor law has realized in taxes $1,494,200, and closed 1,900 saloons.

AN English doctor, experienced in cholera epidemics, reports the disease now prevalent in Egypt as of a distinctly different character from Asiatic cholera.

A DISPATCH received at the Indian office at Washington announces that the great Indian trouble in Indian Territory has been settled in a manner satisfactory to all parties, and peace is henceforth assured.

ON THURSDAY, at daylight, the dividing rock was broken through in the Mullen tunnel, on the Northern Pacific, and engineer J. T. Dodge made the passage through the mountain. Forty-five miles of main line remain to be completed.

A FRIEND to the rich and poor. A medicine that strengthens and heals, is Brown's Iron Bitters.

Successful Patent Solicitors.

As Dewey & Co. have been in the patent soliciting business on this coast now for so many years, the firm name is a well-known one. Another reason for its popularity is that a great proportion of the Pacific coast patents issued by the Government have been procured through their agency. They are, therefore, well and thoroughly posted on the needs of the progressive industrial classes of this coast. They are the best posted firm on what has been done in all branches of industry, and are able to judge of what is now and patentable. In this they have a great advantage, which is of practical dollar and cent value to their clients. That is this understood and appreciated is evidenced by the number of patents issued through their SCIENTIFIC PRESS Patent Agency (S. F.) from week to week and year to year

Oh, My Back!

That's a common expression and has a world of meaning. How much suffering is summed up in it.

The singular thing about it is, that pain in the back is occasioned by so many things. May be caused by kidney disease, liver complaint, consumption, cold, rheumatism, dyspepsia, overwork, nervous debility, &c.

Whatever the cause, don't neglect it. Something is wrong and needs prompt attention. No medicine has yet been discovered that will so quickly and surely cure such diseases as BROWN'S IRON BITTERS, and it does this by commencing at the foundation, and making the blood pure and rich.

Wm. P. Marshall, of Logansport, Indiana, writes: "My wife has for many years been troubled from pain in her back and general debility incident to her sex. She has taken one bottle of Brown's Iron Bitters, and I can truthfully say that she has been so much benefited that she pronounces it the only remedy of many medicines she has tried."

Leading physicians and clergymen use and recommend BROWN'S IRON BITTERS. It has cured others suffering as you are, and it will cure you.

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Remarkably healthy, being 2,000 feet above the sea level.

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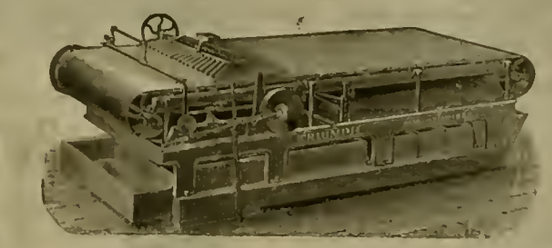
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STEEL CASTINGS

FROM 1-4 TO 10,000 lbs. WEIGHT.

True to pattern, sound and solid, of unequaled strength, toughness and durability.
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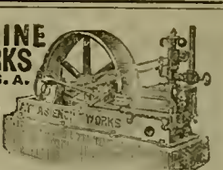


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The Best Crusher in the Market and at the Lowest Prices. Power, Hydraulic Ram or Cylinder Elevators, Hand Power Hoists, for sidewalks any purpose, Saw Arbors and Mill Fittings. Repairing promptly attended to

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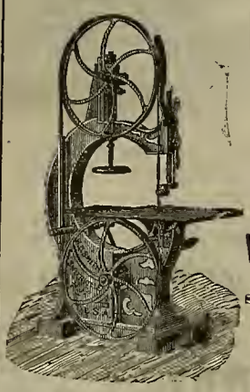
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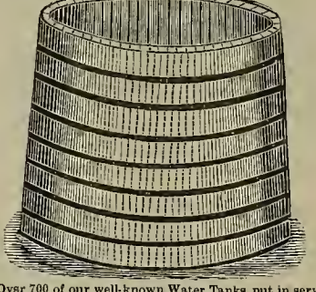
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Complete smelting plants made to order of any capacity and with all the improvements that experience has suggested as valuable in this class of machinery. Skilled and experienced smelters furnished when desired to superintend construction and running of furnaces. Estimates given upon application. Send for circular.

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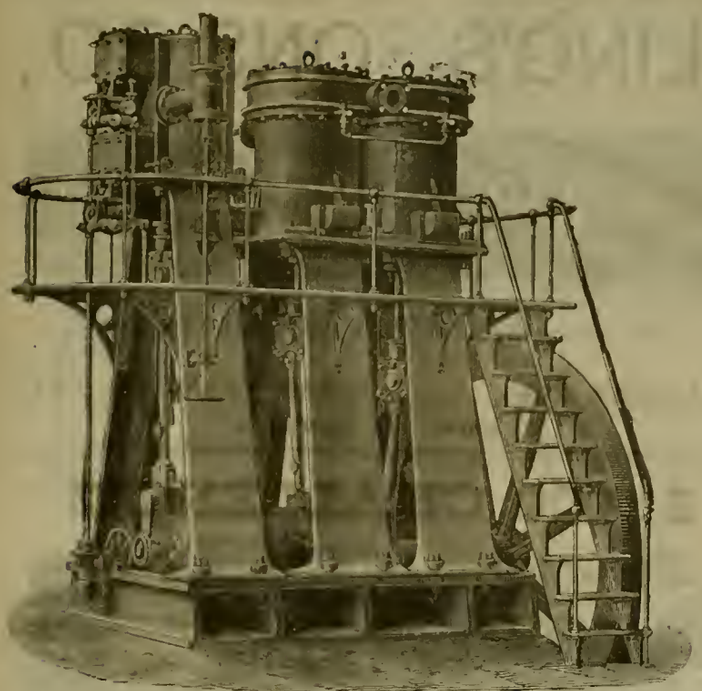
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Absolute certainty in the action of the valves at any speed. Perfect delivery of the air at any speed or pressure. The heating of the air entirely prevented at any pressure. Takes less water to cool the air than any other Compressor.

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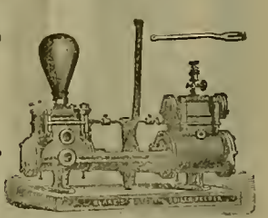


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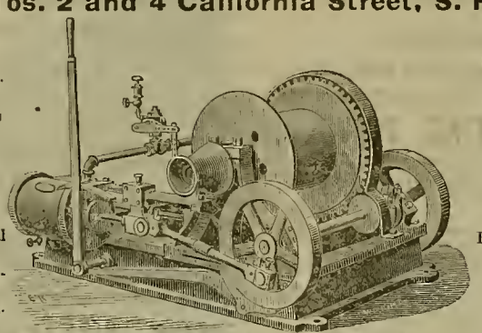


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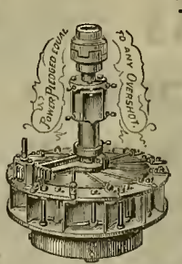
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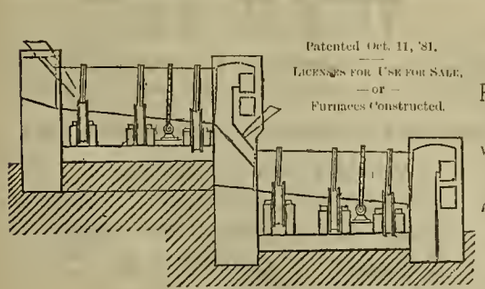
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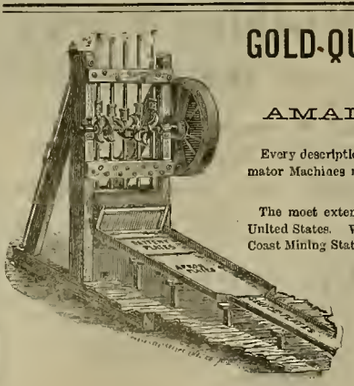
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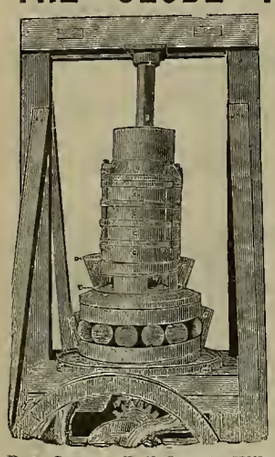
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The powder is put up in cartridges of any size to suit the consumer, and is exploded in the same manner as all other high explosives; that is, by means of cap and fuse, or by electricity. It is not claimed for this powder that it is a non-explosive, or safer than other nitro-glycerine powder. All powder, and especially nitro-glycerine powder, should be handled carefully. The EXCELSIOR POWDER is as safe, and for strength far surpasses any other powder on the market. Address all orders to

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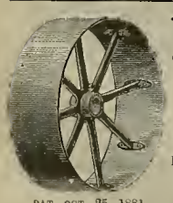
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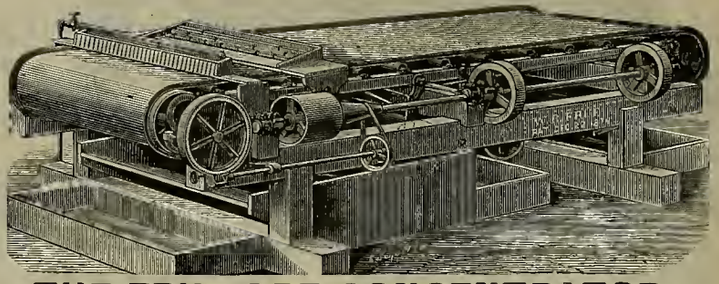
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Over 400 are now in use, giving entire satisfaction. Saves from 40 to 100 per cent. more than any other Concentrator in use, and concentrations are clean from the first working. The wear and tear are merely nominal.

A machine can be seen in working order, and ready to make tests, at the office of Hinckley, Spiers & Hayes, 220 Fremont Street.

To those intending to manufacture or purchase the so-called "Triumph" Concentrator, we herewith state:

That legal advice has been given that *all shaking motion* applied to an *endless traveling* belt used for concentration of ores is an infringement on patents held and owned by the Frue Vanning Machine Company.

That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.

That the patent laws make *users* of infringements responsible as well as makers, and the public is therefore warned that there is considerable risk in purchasing any end-shake machine until our various patents have been decided.

That if there are those who for any reason prefer an end-shake machine, we can manufacture and sell to such machine of that description, as efficient as the Triumph, and at a lower price, and no liability for infringement will then be incurred by the purchaser.

That we shall protect ourselves against any one making, selling or using any machine infringing any of our patents. Patented July 9, 1867; May 4, 1869; Dec. 22, 1874; Sept. 2, 1879; April 27, 1880. Patents applied for.

That we are, and have been, ready at any time, to make a competitive trial against the Triumph, or any other machine, for stakes of $1,000.

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It derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.

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No. 1 (XX) is the Strongest Explosive Known.

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In kegs and cases. The Best Low Grade Explosive in the market. Contains no Nitro Glycerine. Superior to Judson or any Black Powder made.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, AUGUST 25, 1883.

VOLUME XLVII
Number 8.

The Nichols Furnace.

The essential improvement in this furnace is in the use of a removable outside well or hearth, into which flow both slag and metal as fast as smelted. The use of an outside well is not new, but the novelty and improvement consist in the method of making an immediate connection between well and furnace, which allows of a change of the former in a few minutes, should cutting or chilling render such necessary.

Near the bottom of the furnace is an opening 7"x6", the circle of the furnace being flattened at this point to allow of close contact with the water-jacket face of the well. The face of the well is formed by two square frames of wrought iron, covered by soft sheet steel or boiler iron, in such manner as to leave a water space between, and the smaller inner frame corresponding in size and height to the opening in the furnace. The well itself is built of ribbed cast plates, bolted together, lined with fire-brick and mineral wood to prevent chilling, and mounted on wheels, with a flat arched brick lined cover. Near the top, on the side away from the furnace, is a regular slag spout, and below on one side a tap-hole and spout for the metal, which can be tapped at intervals; or, in case of lead, a small outside dipping-well can be bolted on, as usual, on the furnace itself. The well is guided to its place against the furnace by the two outside rails, as shown in cut.

The connection is simply made by running the jacketed face of the well against the corresponding hole in the furnace, attaching rubber hose connections to the water supply pipes, and then letting blast on to furnace. Any slag which might naturally leak between the two faces is immediately chilled and forms a perfectly tight packing between them.

The advantages claimed in practice for this arrangement are as follows: The removal away from the furnace itself of all brickwork which can be cut by the slag, so that repairs can be made without hindrance to the smelting operation. The discharge of the whole product of the furnace is through the opening in the water-jacket itself, which is practically indestructible. The discharge into well, being below the level of slag issue from same, prevents all escape of fumes and keeps the contents of well uniformly hot. The discharge of slag, being at a lower point than usual in furnaces, exerts a favorable influence on the uniform working of the charges.

Three different sizes of furnaces have been in use for a year at the Laurel Hill Chemical Works, Laurel Hill, Long Island. The material smelted is a roasted pyritous ore containing between 3 and 4 per cent of copper, and the fuel employed is common gas coke. An ordinary water jacket furnace was at first employed, but the frequent stoppages and repairs gave rise to a series of experiments which have resulted in the adoption of the present improvement, and no difficulty is now experienced in continuous running.

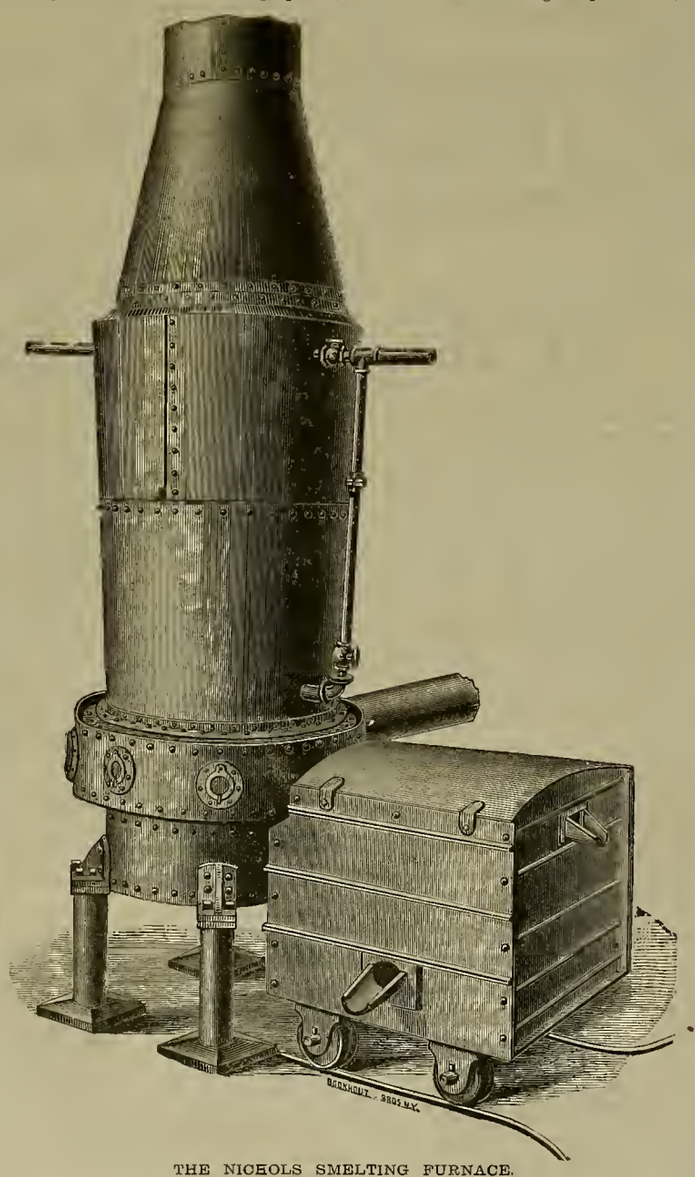
The improvement has been covered by letters patent granted to Messrs. Nichols & Horreshoff, and can be applied to all kinds of furnaces, square or circular, water-jacket or brick-work. Messrs. Fraser & Chalmers, manufacturers of mining machinery, Chicago, have arranged with Messrs. Nichols & Co. to manufacture their improvements in combination with their various patterns of water-jacket furnaces, and recommend the addition to the attention of lead and copper smelters.

Copper.

Until within the past few years the miners of this coast took very little interest in the subject of copper mining. With poor transportation facilities, lack of knowledge of smelting, and an experience somewhat discouraging as to results, there was a poor outlook for this kind of mining. The success of a few properties, however, has encouraged the owners of others, and the business is rapidly growing. A couple of years ago the Pacific coast was not considered in connection with copper production, but now the copper from here makes quite a figure in the statistics for the year.

As England is the great copper market of the world, some statistics of the trade there will be of interest to our copper miners.

James Lewis & Son, of Liverpool, report a steady trade in copper for the month, and quote the value of Chili bars at £63 10s; ores of twenty-five per cent are 12s. 3d. to 12s. 6d., and regulus 13s. per unit. From statistics they give, an increase is shown in the supplies of copper for England and France, and also an increase in English and French consumption and English export of 4,922 tons, or a difference of 2,444 tons; whereas last year there was a decrease in the stocks during this period of 1,417 tons; this year there has been an increase of 1,027 tons. The Chili exports to July 30th, for the year, are 26,946 tons fine. The stocks of Chili produce are equal to 26,245 tons fine. The total visible supply is 51,913 tons of fine copper, against 49,881 tons on July 1st and 49,667 tons on August 1, 1882.



THE NICHOLS SMELTING FURNACE.

The total amount required for rivers and harbors for the fiscal year will be upward of $35,000,000.

New Ore Feeder.

Wm. E. Wild, of this city, has received a patent through the MINING AND SCIENTIFIC PRESS Patent Agency for an improved ore feeder of peculiar construction. The hopper is divided into two compartments, and its lower end rests on the rear of a tray or hollowed plate, which projects in front of the stand or frame. The forward edge is rounded, and its center is cut out slightly, thus forming an opening at that point and leaving on each side what may be termed lips.

Mounted on the front standard of the frame of the feeder is a shaft on which is keyed a hub having radial arms or paddles. This hub is over the longitudinal center of the tray, and a portion of it fits within the opening of the front wall of the hopper. The arms travel outward, just over the bottom and front opening of the tray. A succession of levers are arranged so that one is struck by the tappet as it falls, and this operates a friction arm or heavy bar, which impinges on a friction pulley. This friction pulley is on the shaft carrying the hub and arms constituting the feeding device. This part of the mechanism is ingeniously arranged, but a description in detail is difficult without engravings. As the tappet moves the levers and rotates the friction wheel, shaft and feed wheel the feeder arms revolve and scrape or push whatever may be in the tray forward over the edge of its opening.

The means for operating the feeder arms are simple and sufficiently positive for the comparatively short movement. By constructing a partition in the hopper in the peculiar manner which his invention does, he claims to prevent all clogging of the ore. The ore works down the sides of the tray and reaches the feeder arms from each side. These, by revolving in the partition, encounter no ore behind them, but only when they move down to and scrape over the bottom of the tray. They are therefore not impeded in their forward movement. The raised side lips of the tray prevent the ore from falling out. If there were no partition in the hopper, and the ore were allowed to gravitate to the tray over its entire surface, the arms could not revolve, but would bind against the mass from the rear, which would soon clog in the throat. In this feeder, however, the ore falls into the tray from each side, and it does not interfere with the arms, as these are protected within a partition.

Two miles north from Bonanza City is a thirty stamp mill, run by 118-horse power Harris-Corliss engine; three 54-inch boilers, 16 feet long, 8 pans, and 4 settlers. The Gen. Custer mine and Unknown are owned by the same company. The mill was built in 1880, and has been working on Gen. Custer ore continually up to the present, but is now clearing up, and will start working ore from the Unknown. The bullion has averaged over $60,000 monthly; 35 tons of ore were worked every twenty-four hours. Chris. Morler is the superintendent of the mill, and Samuel Odgers superintendent of the mines. The mill employs 32 and the mines 36 men.

THE concentrating mill attached to the Little Ellen mine, Leadville, has been burned. Estimated loss, $15,000; fully insured. The mill never was a success. Most of the machinery had been removed.

CORRESPONDENCE.

Arizona Mining.

[From our Traveling Correspondent.]

Around Turkey Creek.

The Con. Bodie mines, incorporated by a New York company, lie on Crook canyon, about twenty miles south of Prescott, two and a half miles below Spence's station. They have heavy smelting silver galena ores, and 400 to 500 tons on the dumps. Ledge matter is from four feet to twelve feet thick. The shafts are 80 and 100 feet deep; a tunnel is 480 feet in on the lead. Lime and iron ore for flux are convenient, and reduction works are expected soon. Some $15,000 have been expended in prospecting the mine.

Good smelting works at this point will be of great advantage to the mines that lie for seven or eight miles above on Crook canyon that formerly "arastrared" the free croppings, but now need a smelter for their changed ores, which are rich.

It is claimed that where the ledge is twelve feet thick forty-one assays were made to test the average value of the ledge, which gave $61 silver and forty per cent lead.

The Wallace, in the same district, has a fine showing of silver ore for the small amount of development made; best assays run over $400 per ton. This is now bonded to Murphy & Co., mining brokers of Prescott, who are handling some fine mining properties. The "Duncle mine," near by, is also promising well as far as developed.

These claims, like a large proportion of the claims of this country, have country rock of granite and slate.

Turkey Creek District

Was organized about 1864, and has always been noted for rich ores, but for various causes has not had any very thorough and extensive works. It has yielded rich ores, and the proceeds have been consumed in expenses of living—making further developments on small prospect scale.

Within the last year some new life is developing, and now scarcely a week passes that one or more countenances are not radiant with the glow of success, as the miner says, "I have strnck it," and at the same time showing the genuine chloride or horn silver, worth sometimes as high as $2,000 per ton.

The Turkey Creek mining company's plant is owned by Chicago and Wisconsin capital; Mr. Paul Lachmond is superintendent. The plant is now nearly completed, and consists of a five-hearth reverberatory furnace, with its castings from Frazer & Chalmers, Chicago, erected by J. B. Brown, who has had extensive experience in the State of Nevada and Arizona during the past twenty years in erecting the various improved furnaces.

The thirty-ton water-jacket furnace is from Rankin & Brayton's Pacific iron works, San Francisco. They also have a sawmill attachment running ont the lumber needed. There are several mines belonging to this company now being developed by a small number of men. Their deepest shaft is 276 feet, and about same length of drifts. They have now 1,400 tons of ore on the dnmp, and a small force opening up drifts in the mines. From all appearances, "Freanor's Camp," as this was formerly called, will soon be turning out its sbare of base bullion. They are well favored with abundance of wood and water. So abundant is the wood that they expect to smelt with charcoal only for a while. They have engaged for smelter Cecil W. Brown, well versed in this branch of metallurgy.

The site and relative situation of mines and works seem well planned. The problem of success is reduced down to the simple equation of "how much ore, and how rich is the ore." But even rich, large veins cannot supply large amounts of ore until considerable cash outlay has prepared the mine for profitable stopings. This is the

Principal Cause for Discouragement and Failure

Here in Arizona. The mill or smelter is erected before the dead work openings are made for the quick and cheap extraction of ores. Then when the large ore yield is wanted, they gonge out all the ore in sight quickly, and soon the mill or smelter must stop for want of ore, though abundance of it is in the mine.

The constituents a long way off, who had been assured there were millions of tons of ore there very easily mined, now get scared and tie a hard knot on their purse and refuse another dollar. "If that $100,000 purchase and plant can't pay its way now it can go, or stop right still for a while." This is what has been said and acted many times. And true and honest miners who sold the mines, and the trusted and able expert who reported only the solid facts as he thought he saw them, have been condemned, often very wrongfully, and the mine and plant pronounced a failure, when nothing was lacking but the proper opening for the practical working basis of the mine.

"A Case in Point."

A Boston and Rhode Island Company bought a mine in the State of Nevada for $120,000, after having full privilege of taking out tons of the ore and getting it reduced where they chose and taking all the samples for assays they thought proper to take the advice of the best practical experts and every precantion to ensure safety on their part. The bargain was closed and $20,000 only was advanced and a mortgage for the balance of $100,000 was given on mill of 20 stamps, already erected by the purchasers, to the sellers of the mine as security till paid. The cash $20,000 was paid over in Boston and the mortgage properly executed and full possession given the purchasers, and their superintendent sent on to take charge of the new mining enterprise. The honest miner who sold, intrusted this mortgage to the superintendent's care to have it placed on record in Nye county, Nevada, and supposed it was all properly recorded. But what was the astonishment of two honest and honorable miners when they found out a year subsequently that their mortgage had never been put on record, but that the Bank of California held a mortgage on the property for $30,000 with interest, and that the mine was worked out of the available rock in sight and now thrown up as worthless to get clear of completing the payment, and the honest men who showed them a mine with pay ore for more than 100 feet in the tunnel, was now defrauded entirely of their property.

The Bank of California sold the mill and it was moved. The laborers by early suits and attachments succeeded in getting a portion of their wages. Eventually by U. S. law the mine was subject to relocation at a certain date, and who should arrive there at day dawn but this same Lieutenant and former superintendent, eager to locate that same property that he had defrauded from both his constituents and the pioneer locators of its possession. But the Lieutenant found himself distanced by a youth who had slept on that spot over night expressly to be there at the earliest hour of our civil and legal day.

He located this mine that had been reported back as worthless to the honest stockholders at Boston, with a strong implication of fraud on those who had sold it to them. This same mine has since sold for cash all in one check for $672,000 (if memory makes no mistake in the exact figures).

No doubt some frauds have been perpetrated by the sellers of mines, but by far the greater cause of disappointment to stockholders comes from an inefficient handling of the mine after the purchase, and not appreciating fully the cash necessary to place a mine on a producing basis, or so open it that stopings can be speedily and profitably removed.

From the Turkey Creek company's works you can pass by trail over a high dividing ridge to the old Goodwin mine, one of the mines belonging to the

"Nonsuch Mining Company"

Of Philadelphia, and was named after the first Territorial Governor. This is a Pennsylvania corporation, the headquarters being in Philadelphia. Joseph G. Henszey is president, and Samnel A. Henszey is general manager, in charge of the plant. The property of the company consists of 2,400 lineal feet on the famous Goodwin lode, in Turkey Creek mining district, about three miles from the town of Goodwin (Buena Postoffice). The property has npon it openings aggregating considerably in excess of 700 feet. The principal development consists of a main working shaft, of slight incline, 187 feet in depth, which is connected by level with another shaft 125 feet deep, while some distance south from the latter is another shaft 120 feet deep. This mine not only bears evidence of greater development than any other property in the district, but can also boast of greater bullion shipment. Inaccessibility of the record of former owners renders a statement of bullion output impossible, but the character of ore now being extracted justifies the assertion of its earlier product. The present owners have had possession but a trifle over a year, during which time they have pursued a systematic course of opening the mine without drawing upon ore reserves. They are now commencing to take out ore, and will soon make their first shipment. The character of ore is largely black sulphurets with argentiferous galena, considerable native silver, and more or less ruby silver. The outlook of this property as a permanent bullion producer of large quantity is beyond question favorable. Operations are conducted upon a strictly conservative basis. The entire capital stock is subscribed, paid in and owned by less than a dozen persons, who conduct the affair as a close corporation. They have the improved iron drum whim, with wire cable and safety brakes, which seems in every way very efficient and safe for the present requirement. I found Mr. McCann, a very practical and intelligent miner, in charge of the hoisting apparatus and the mine.

Arizona Con. Mill and Mining Co.

This company, organized under New York laws, have a complete quartz mill and roaster capable of treating fifteen to twenty tons of ore per day. The plant is immediately on Turkey creek in the district of that name, and about twenty-two miles southeast of Prescott, on the regularly traveled stage road. The mill site adjoins the town of Goodwin. The mill having undergone many changes and modifications that were found necessary subsequent to its first completion, is now believed to be in good running order. It is not a stamp mill. The process is at once simple and apparently effective. The ore is delivered upon a platform of equal level with the upper story of the mill building. In this room is a rock crusher, now a "Little Giant," the company being about to commence the erection of a "Blake's Challenge" to secure additional capacity.

Having by means of these crushers been reduced to particles the size of a walnut, the ore is conveyed to the "pulverizer," which, in the present mill, acts in place of the ordinary stamps; this apparatus being upon a lower floor, the process becomes continuous. The ore falls into a hopper, by which means it is fed into a cylindrical vessel about twenty-four inches in diameter; in this two arms make 3,000 revolutions per minute, and coming in contact therewith, the ore, or a very large percentage of it, is reduced to an impalpable powder, and passes out the circumference of the cylinder through small holes in the lining. The pulp is then caught by an elevator and taken to the screens—first a forty, then a sixty mesh.

Process of Amalgamation.

Such portions as pass the latter are ready for amalgamation, for which portion of the reduction, this mill employs two processes. The first, known as the "Forster-Firmin," embodies a principle meriting description. Against a stream of the fine pulp is projected a column of quicksilver by strong steam pressure, almost sufficient to vaporize the mercury. The force of the steam in itself compels amalgamation, but to render the operation more complete, the mass is projected with this great power into a large iron chamber. From this the amalgam falls to a large washer on the floor beneath. In this washer are two heavy iron mullers which further facilitate progress of the operation. At the proper time a chamber attached to the pan—the bottom of which is conical—receives the amalgam, while the watery mass remaining in the washer is drawn into residuary pans and the result worked very closely. The steam power for this mill is furnished by a superior 45 H. P. horizontal engine, which we are assured affords superabundance of power. The machinery appears to have received much attention in every detail, and bears evidence of large expenditure. A trial run of twenty tons free gold ore showed but a trace remaining in the tailings, the assay value of the ore being $56 per ton, which would appear to be a conclusive proof of the efficiency of the mill.

The company have displayed foresight in providing duplicate parts of such portions of machinery as are likely to break. They have also a new engine, not yet erected, a fine circular saw and outfit, a Victor rock drill, besides 600 cords of wood on the mill site.

The principal mine owned by the company is the "Morning Glory," distant from the mill about three miles. It is rich in free gold above water level, and the sulphurets below water level can be worked to profit when reduction works are perfected in the vicinity or transportation for the ore secured. The company have several silver claims adjacent to the mill, but have only prospected them as yet, with excellent showing, however.

The company's president and general manager are the same as the Nonsuch, Mr. Samuel A. Henszey, the manager, having provided himself with quarters adjoining the mill.

Abundance of water and timber constitute two great advantages of this camp, which in view of the recently uncovered bonanzas is likely to assume considerable prominence among the bullion producing camps of the country.

We old Pacific coasters admire the true progressive disposition and courage of our new companies to excel the mills and processes now in use, and with much satisfaction record every claimed success, but only a long and continued trial record will establish a permanent record of success and displace the old line of tried machinery and straight line stamp battery. Improvements are needed, and I hope to see yet even greater advancements than have been made since our gold and silver era began.

B. W. CROWELL.

Prescott, Arizona.

Columbus District, Nevada.

EDITORS PRESS:—Believing that a line from this old and well-known mining center will be acceptable to your many readers, while it may at the same time be the means of calling the attention of strangers and those seeking safe investment in good mining properties to this locality, I take the liberty of writing and forwarding this communication.

The Columbus mining district is situated in the southeastern part of Esmeralda county, Nevada, and tapped by a branch of the Carson and Colorado railroad. It is the home of the Mount Diablo, Lucky Hill, Great Eastern and Columbus Consolidated mines, besides many other first-class locations, and above all, that of the famous old Northern Belle mine, a part of whose history is, that since the first day of May, 1875, she has yielded and shipped bullion of the value of *ten millions* of dollars, has never yet levied an assessment, but, on the contrary, has declared in the neighborhood of seventy-five or eighty dividends, through which she has paid in the aggregate not less than $5,000,000 to the stockholders.

It is strange, but nevertheless true, that for some reason our local paper, the *True Fissure*, in its weekly mining reports, which I notice you copy in full, gives to the stranger, outside of its reports of the doings of the Mount Diablo and Northern Belle, no idea of the mines and mining resources of this district. Hence, more especially, this effort to do something in that direction.

It was the unreserved and universally expressed opinion of the late and much lamented Prof. W. Frank Stewart, geologist and famous mining expert of the Comstock, and of this State and the Pacific coast generally, after his third official visit to and examination of the mines of this district, that in no other part of Nevada, or of the entire coast, so far as he knew, was the mineral belt so extensive or better defined than this, the

Mineral Belt of Columbus District.

And also, that owing to the extent and peculiar manner in which the mineral deposits of this belt were distributed, as manifested by developments in the Northern Belle, Mt. Diablo and other mines, no other district within his knowledge offered so many and favorable inducements for the investment of capital with an almost certainty of the development of an extensive, lasting and paying mine.

In addition to the professor's thorough examination of and familiarity with the mineral wealth of this district, he doubtless also took into consideration the fact that in working the mines of this locality

No Water is Encountered,

Nor is any timbering required—the two most important items considered in the cheap and successful working of mines; also the early history of the district, dated from 1871 to 1873, when Messrs. Sweetapple, Hazeltine & Lewis run their little five-stamp mill at Columbus, and by which and within the dates given they shipped some three millions in bullion, while they realized at the same time, and left the country with—at about the time of the advent of the Northern Belle mill and mining company—a snug little fortune of about $250,000 each. Knowing this, in addition to his knowledge of what the Mt. Diablo and Northern Belle and other mines of the district had done up to 1881, Prof. Stewart hazarded nothing of his reputation in the expression of the opinions aforesaid.

The Lucky Hill, a mine owned and controlled by E. J. (Lucky) Baldwin, of San Francisco, the Columbus Con., owned by Eastern capitalists, and the Great Eastern mine, owned by O'Neil, Turner & Co., old prospectors, are developing rich and extensive bodies of ore which are certain, within a very brief space of time, to make them paying mines, and thus bring them prominently to the front, in connection with the Mt. Diablo and Northern Belle, as paying properties of the district.

And now, sir, in addition to the foregoing, and in the interest of any individual or associated capitalist who may desire or be seeking a good and substantial mining investment, to say nothing of the interest of the old-time prospectors who located and still own it, I particularly desire to call attention to one of the mines before mentioned, to wit:

The Great Eastern,

Which is destined beyond a doubt, should it fall into other hands able to develop its resources, to prove itself a second Northern Belle, and thus enrich whoever may be its fortunate owners. This location is in the very center of the mineral belt. It commences about 600 feet east of the Mt. Diablo location, and consists of 1,500 feet running east and parallel with and about 600 feet north of the Jackson mine. The Great Eastern being the oldest location within ist neighborhood, though not patented, possesses, nevertheless, a perfect, undisputed, clear and unclouded title. At about the center of the claim, and about seventy feet north of the main ledge, an almost perpendicular shaft has been sunk to a depth of 110 feet. It is all the way in a most favorable ledge matter, and at a depth of between sixty and eighty feet cut three mineral veins ranging from eighteen inches to three feet in width, all carrying a low-grade ore. About 500 feet east of this shaft is an incline shaft sunk upon the ledge last summer to a depth of 75 feet, mostly in high-grade ore. With a very little money at the beginning and in proper hands, this mine can undoubtedly be made to pay its way from the start, with every favorable prospect of its developing into a first-class mining property. On behalf of the prospectors and many miners of Candelaria and Columbus mining district, a cordial invitation is hereby extended to strangers visiting the mines of this coast to give us a call and examine our mines for themselves. PIONEER.

Candelaria, Esmeralda county, Nev., August 13, 1883.

ANOTHER BORAX BOILER.—Netherton Bros.' team loaded a boiler for Marrotte & Co., of Columbus, on Monday last. It is fully as large as any of the many which have been shipped to the scene of the borax excitement. It is twenty feet long, six feet in width, and two and one-half feet in depth. Besides this, the wagon was loaded with galvanized iron for the construction of seven tanks and a settler. The manufacture of borax is becoming more and more a factor of the southern part of the county. It is adding new life to the town of Columbus from a business standpoint, and is an encouragement that should not be lost sight of as prominent among the industries of Esmeralda. Though times are dull, this is far from a dead community.—*Candelaria True Fissure.*

YANKTON MINING CLAIM NON-MINERAL.—The acting Secretary of the Interior has affirmed the General Land Office decision denying the application for a patent upon the Yankton mining claim at Carson, Nev., upon the ground that the land is non-mineral.

OLD BRONZE TOOLS.—At Salez, in the Swiss canton of St. Gallen, some 60 bronze hatchets have been dug up from a depth of about 18 feet beneath the surface of the ground. These implements are believed to be about 2,500 years old.

MECHANICAL PROGRESS.

Machine Foundations.

The following article, written by M. Powis Bale, M. E., and published in the *United States Miller*, contains many points of interest, and much information especially valuable to machinists and builders:

The proper fixing on adequate foundations has much to do with the satisfactory performance of wood-working machinery, and in the case of high-speed machines, especially those with a reciprocating motion, the jar or vibration is absorbed in a very considerable degree by the foundations, as well as by the framing of the machine. In the case of machines working on the rotary principle, little difficulty is experienced as regards foundations, the stress being, as a rule, easily absorbed by well-apportioned framing; that is on the assumption that the working parts are all truly balanced and fitted.

In the case of vertical saw frames, it has been attempted to do away with the ordinary masonry foundation by mounting the frame of the machine on an extended cast-iron bed-plate, or in light deal frames, by casting the main framing of the machine in one piece. The extended bed-plate system is not to be recommended, except in cases of necessity, where the foundations are had from the ground being marshy, or from overflow water in tidal rivers, or such like causes, as the vibration is not by any means done away with; by using this form of bed-plate, small deal frames may be made very strong and compact by casting the frame solid; but they are somewhat more difficult to make and repair.

Where much water that cannot easily be got rid of is found, and where it is necessary to put in a deep foundation, especial means must be taken to get, in the first instance, a solid basis. Where the weight to be supported and the vibration to be absorbed are considerable, as in the heaviest class of log-sawing frames, we have found a series of English elm piles to make a durable and satisfactory foundation. The depth they should be driven and the distance apart must depend on the action of the machine, the weight of the load, and the nature of the soil. The tops of the piles should be sawn off level, and sleepers or planks fixed transversely on the top of them. The piles and sleepers should be creosoted. Where the ground is moist only, and much concrete is unnecessary, a good plan is to ram the substratum firm and cover with a layer of broken stone or slag, to about six inches in depth; into this layer pour melted asphalt. This binds together in one solid mass, prevents damp, and gives a good foundation for the subsequent masonry.

The vibration of saw frames is lessened considerably by counterbalancing their reciprocating parts, and by arranging the crank-shaft as near the base of the machine as possible, and a fly-wheel or wheels are found to add considerably to their steadiness in working.

The vibration of a machine may be also considerably lessened by the introduction of a sheet of lead between the base of the machine and the masonry for light machines; on an upper floor a thick sheet of felt may also be used with advantage.

As regards the masonry employed for foundations, stone is the best, and offers a better resistance than brick work, but its cost is somewhat of a bar to its general adoption. A deep bed of concrete, if well laid, will also be found very serviceable. The strength of a stone foundation depends greatly on the quality of the stone employed, and also whether the size and shape of the blocks used are in proportion to the strength of the stone; the mortar, too, used for this purpose should be of the finest quality, and the stones accurately dressed. If the dressing is badly done, and the pressure is unequal and severe, they are liable to fracture. Blocks of stone of long dimensions in proportion to their thickness should never be used, as with heavy machines with a reciprocating motion, with a positive stroke or dead blow, the risk of breakage is considerable. A safe rule is to make the length of the block, say about three times the thickness, and the width one a half times. Great care should be taken that the masonry is accurately leveled, and set as nearly perpendicular to the direction of the stress as possible. The top blocks should be clamped together, and the joints filled in with molten lead, as excessive vibration and stress is in a great measure overcome by the weight and solidity of the foundations; the framing of the machine should be made to combine as far as possible, and made integral with it.

The quality of the work turned out and the longevity of the machine depend also more on the stability of the foundations than is generally imagined. The foundation bolts should pass entirely through the masonry, and either be cemented in their places; or, should they not be cemented, they will be found less liable to work loose by putting a piece of hard wood between the plates and the masonry. Wood-working machines with a reciprocating motion should never be put on an upper floor, except those of the very lightest class. In machines with a rotary motion, and the straining forces acting horizontally to the axis of motion, brick-work or timber foundations are usually sufficient, but for the heaviest class of machines, such as rack-saw benches or planing machines, if the earth is all unsound, concrete or rubble masonry should be used; for heavy log frames, steam mortising machines, etc., ashlar masonry is undoubtedly the best. Any reasonable cost incurred for perfect foundations is soon repaid by increased steadiness in working, and consequently improved quality of output. As a rule, inferior production in machines with a rotary motion is directly traceable to inferior workmanship or design in the machine, loose bearings, weak spindles, improperly sharpened cutters, insufficient feed, or unbalanced cutter blocks; but it cannot be denied that, in the first instance, weak or insecure foundations contribute largely through imperfectly absorbing the vibration, to bring about some of these results, especially in machines with their framings put together in sections. If brick-work foundations are used, the bricks employed should be hard and well burnt, and Portland cement should be used; this is especially necessary in damp situations.

As regards brick foundations for machinery, Mr. Trautwine, who has experimented a good deal with building materials, says on this point, that a rather soft brick will crush under a weight of about 30 to 40 tons per square foot, whilst a first-rate machine pressed brick will require from 300 to 400 tons per square foot. This last is about the crushing limit of the best sandstone, or two-thirds as much as the best granites or roofing slates. But masses of brick-work will crush under much smaller loads than single bricks. In some experiments referred to by this author, small cubical masses only 9 inches on each side, laid in cement, crushed under 27 to 40 tons per square foot; others with piers 9 inches square and 2 feet 4 inches high, in cement, only two days after being built required 44 to 62 tons per square foot to crush them. The same authority, however, is careful to add the statement that cracking and splitting usually commence under about one-half the crushing loads. To be safe, he recommends that the load should not exceed one-eighth or one-tenth the crushing load; so also with stone if bricks are used as foundations. For some kinds of wood working machinery, such as steam mortising machines and saw frames, where there is what we may call a constant punching action going on, we certainly think the dead weight should not exceed about one-sixth the crushing load.

The Properties of Oils.

M. Chevreul found metals to have, in certain cases, a remarkable influence on the oxidation of oils. Recently, the *Times* says, M. Livache has used, in this relation, finely-divided metal—such as is got by precipitation—instead of metallic plates, and the effect is greatly increased. He thus tried lead, copper and tin, and found lead to have the strongest action. If precipitated lead, moistened with oil, be exposed in air, an increase in weight is very soon observed, and this is greater the more siccative—or drying—the oil. With linseed oil, the increase of weight reaches a maximum in thirty-six hours, whereas, exposed alone to air, the oil would take several months to reach this maximum. A solid and elastic product is obtained. With non-drying oils the increase of weight is much less, and takes much longer to be completed. The result in question, M. Livache points out, cannot be attributed to a simple division of the matter, allowing more active circulation of air, for the same experiment made with various other substances in fine division does not result in any like increase of weight; the effect here is merely like that in the case of a thin layer of oil exposed to air. The change in the other case must be attributed to a direct action of the metal. He suggests what industry may derive certain advantages from the facts observed. Thus a rapid method is indicated of distinguishing dry from non-drying oils. Further, the heating of oils might be advantageously replaced by a circulation in contact with air and in the cold state, over iron or fine plates having precipitated metallic lead on their surface. The oils so obtained would be always less colored, and would retain great fluidity, while the objectionable odors and the danger of fire which attend the present mode of treatment would be avoided.—*Cotton and Iron.*

PROPER SIZE OF GRATE-BARS.—In answer to the question, "What are the proper length and size of the grate-bars?" Mr. Edwards, in the "Practical Steam Engineer's Guide," says: "When the furnace is more than four feet long the bars should be put in in two lengths, but if it is four feet or less in length, one bar will suffice, in which case only two bearing bars will be required. When a center bearing bar is used for two lengths, it should be made like a double grate-bar—that is, with an opening or air space in the middle. Grate-bars when hot expand considerably, and, therefore, they should not be put in tight or too close together, but should have both end and side play, otherwise they will bend and twist out of shape and soon be destroyed."

COPPER FOR ROOFING. In speaking of the cost of building materials an architect recently suggested the use of copper instead of galvanized iron or "terne" sheets for roofing purposes. He said that copper costs only about double the price of tin, or iron, for the same area of roof; that it is practically indestructible by time, and that even if the building it covers is pulled down, the roofing material possesses an absolute value. The price of copper has seriously declined within the past year, and if the supply continues to augment much more, the metal will soon be as cheap as tin.

SCIENTIFIC PROGRESS.

The Conservation of Solar Energy.

The June number of the Philosophical Magazine contains an article by E. H. Cook on Siemens' new theory, in which the author proves that CO_2 is distributed uniformly throughout our atmosphere, and concludes that the power of gaseous diffusion is such as to equalize the disproportion of gases which Siemens finds necessary for his hypothesis. Siemens in reply admits the uniform distribution of CO_2 in our atmosphere which is subjected to powerful circulating currents, but does not think that gaseous diffusion can work quickly enough to interfere with his photospheric currents. The effect of the slow action of gaseous diffusion he thinks would be inappreciable upon gaseous currents which arise from solor rotation, which amounts to 4,500 miles an hour.

The metallic vapors in the photosphere are chiefly due to mechanical intermixtures. The metallic vapors thus introduced into the photospheric current will be burnt and projected outward into space, not as a vapor, as supposed by Mr. Cook, but as a metallic dust much denser than the surrounding medium; the larger portion of which will, according to Siemens, return to the sun by virtue of solar gravitation and be dissociated on reaching the gaseous metallic sea underlying the photosphere. Siemens then aims to show that the light metallic vapors will be held in suspension in this metallic ocean in the same way that oxygen and carbonic anhydride are retained in sea water. In regard to Mr. Cook's objection that the preponderance of hydrogen and CO in meteorites is inconsistent with the idea that the meteoric gases have been absorbed in space, Siemens remarks that it is sufficient to know that the meteorites contain all the constituents of our atmosphere except hydrogen, and the latter occurs in our atmosphere combined with oxygen; whereas in space and in the solar photosphere, we have evidence of its separate existence, or in combination with carbon. Mr. Cook's criticism upon the solar fan action is speedily dismissed by Siemens with the imputation that it is not understood by Mr. Cook. It is also pointed out that differences of combustion and richness of gaseous fuel may account for the light of colored stars. In conclusion, Siemens refers to a recent paper by his brother, Dr. Werner Siemens, in which the latter cannot reconcile the nature and cause of the electric potential supposed to exist between the sun and the earth except by the adoption of Sir William Siemens' hypothesis.

Artificial Production.

Chemistry is enabling us to replace animal and vegetable dyes, and to form artificial gems, or creditable imitations. Mineral oils replace animal and vegetable oils for illuminating purposes, and the electric light is treading upon the heels of gas. The expensive outfits for the whale fisheries are comparatively abandoned, whalebone and blubber from the huge marine mammals being less in request. Coral insects may proceed with their submarine constructions unmolested. The sea-tortoise will be pursued less eagerly for its carapace. The ostriches of the desert will be less sought after; and even the great pachyderms of India and Central Africa can be spared to be more usefully employed in extending the march of commerce. Under our enlightened civilization we can now manufacture our own whalebone, coral, tortoise-shell, ivory and feathers, without the need of penetrating into wild jungles and arctic or tropical seas for our supplies. The extinction of whalebone in commerce will not deprive us of our umbrellas, nor the female sex of their parasols and corset backs. Rattans have been converted into wallosin, and horn is shaped into pliable bones, while steel ribs also do duty effectually for baleen. In fact, there is no end to the artificial productions, and the list might be extended indefinitely, including artificial ice, which renders us independent of King Frost; artificial sugar, which we can make from starch or rags; artificial fruit essences; artificial horn, from seaweed; artificial wood, from compressed sawdust or straw; artificial leather, from old scraps of the leather cloth; artificial parchment, from paper chemically treated with sulphuric acid; and, as hides for leather become more in demand, we have come to utilize the formerly neglected skins of alligators, snakes, kangaroos, the porpoise, and other sea mammals and fishes.

PEROXIDE OF HYDROGEN.—Within the past few years peroxide of hydrogen has attracted a good deal of attention and has been successfully employed in bleaching and for other purposes. The question of cost, however, has always been an important item, and it may therefore be of interest to state that a German inventor is now said to have succeeded in preparing economically a product, pure, stable and of constant strength, capable of being easily transported long distances and kept for a long time without losing its bleaching properties. Among other applications of this product, that of the decoloration of animal fibers is the most important, as it does not contain some of the disadvantages of other bleaching agents. For wool and silk it is advisable, before bleaching, to cleanse the materials thoroughly, so as to eliminate all the greasy substances and impurities. For this purpose the inventor recommends a bath consisting of a solution of 5 parts of carbonate of ammonium in 100 parts of water, and after having passed through this the material is to be subjected to soaping and thorough washing with water. The bleaching itself is performed either by immersing the materials in the solution of peroxide of hydrogen, leaving them there at a temperature of from 20 to 30° C., until the decoloration is complete or the materials are impregnated, when they are wrung out and exposed in a room heated to about 20° C., where they are left to dry.

DEEP SEA EXPLORATIONS. It is only a comparatively short time ago that life was supposed to be impossible in the depths of the sea, and that the waters were condemned to obscurity, solitude and immobility. The pressure of the water, the absence of light, the slowness of the renewal of the water, the want of algæ or other vegetable materials, and the experiments of Prof. Edward Forbes upon the diminution of animal life with increasing depth in the Ægean sea, were supposed to prove that life cannot exist at a greater depth than 492 yards. When Captains Ross and Wallich found some animals upon their sounding lines, which had descended to a depth of more than five-eighths of a mile, it was thought that they had either been entangled near the surface, or that they had fallen to the bottom after their death. In 1860 the cable between Sardinia and Algiers was broken, and numerous animals were found upon the gutta-percha insulating surface. M. A. Milne Edwards was consulted upon the subject, and he found conclusive evidence that they had been born and developed at a depth of more than 1,243 miles. These discoveries awakened great interest, and led to the preparation of the steam cutter Travailleur in 1880, for a scientific exploration of the sea depths. The cutter has been employed in each of the three past summers in the Gulf of Gascony, on the shores of the Iberian peninsula, Corsica, Algiers and Morocco, in the Strait of Gibraltar and at the Canary islands, yielding an immense number of animals which were previously unknown, many of which were drawn from depths of more than 3.1 miles.

NITROGEN SELENIDE.—Verneuil has recently sent to the *Bulletin Soc. Chimie* a report of his experiments on the preparation of the selenide of nitrogen which was discovered by the late Professor Wohler in 1859. The Gottingen professor prepared it by saturating selenium perchloride with ammonia gas; but Verneuil finds that the method more recently proposed by Fordos and Gelis for the preparation of nitrogen sulphite yields better results, and he takes 10 grammes of the perchloride and mixes it into a paste with a few drops of carbon disulphide, and the paste is then suspended in a liter of carbon disulphide, in which it is almost insoluble. Into this liquid a current of dry ammonia gas is passed. Flocks of ammonium chloride are precipitated, and the liquid passes from a rose tint to a dark cochineal red color. Finally, the red color disappears and brown flocks are thrown down. The current of gas is continued until the flocks become of a clear orange tint. The liquid is filtered, and the flocks washed with carbon disulphide and dried. On removing the ammonium chloride with water, washing again with carbon disulphide, and drying, the nitrogen selenide is obtained pure in amount equal to 80 per cent of the theoretical yield. It forms an amorphous powder, insoluble in all solvents, having the formula $Se_2 N_2$. When dry it detonates instantly by a shock, being as easily exploded as mercury fulminate, less easily than nitrogen iodide. Potassium hydrate and hydrogen chloride decompose it, producing selenite of potassium and ammonia.

COOLING DWELLINGS IN SUMMER.—Dr. Henry Macauley, of Belfast, has recently made a suggestion which, if followed in tropical countries, will turn the tables on the sun with a vengeance. He suggests that Mouchot's sun engine should be used to pump cold air into dwellings, factories, etc., pointing out that the temperature can in this way be reduced from 100° or more to 60°. He points out that not only will this reduce the temperature especially at night, thus rendering sleep possible, but fresh air will be guaranteed during the day, and the plague of flies and insects would be excluded. The weak point about this arrangement is that it requires ice. We think, however, adds *Nature*, that sooner or later in America, where the heat in summer is more distressing than in any other part of the world, and ice is everywhere, this arrangement, or one like it, is certain to be adopted.

THE ART WHICH PRODUCES A CABBAGE.—At a November meeting of the Philadelphia Academy of Natural Sciences, Mr. Thomas Meehan exhibited a specimen of a cabbage which had, before blossoming, grown to the unusual height of three feet, the spiral coil of the stem, which was to the left, having been thus drawn out without any corresponding increase in the number of leaf scars. The cabbage, in its natural condition, is an insignificant plant without any such head of leaves as makes it of commercial value when cultivated. The desired effect is produced by sowing the seeds of the wild cabbage at a period of the year so late as not to allow the formation of flowers, in which case the vegetative vigor of the plant is expended in the production of the mass of leaves, which become better developed and denser as the process of cultivation continues.

MINING SHAREHOLDERS' DIRECTORY.

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ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

COMPANY.	LOCATION.	No.	AM'T.	LEVIED.	DELIN'QT.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Alta S M Co	Nevada..	26..	25..	July 3..	Aug 7....	Aug 27..	Wm. H. Watson	302 Montgomery st
Albion Con M Co	Nevada..	14..	50..	July 17..	Aug 20....	Sept 8..	A W Havens	309 Montgomery st
Bodie Con M Co	California..	3..	50..	Aug 4..	Sept 10....	Oct 10..	G W Sessons	309 Montgomery st
Chollar M Co	Nevada..	12..	1.00..	Aug 2..	Sept 6....	Sept 28..	W E Dean	309 Montgomery st
Con Virginia M Co	Nevada..	19..	20..	July 11..	Aug 15....	Sept 5..	A W Havens	309 Montgomery st
California M Co	Nevada..	8..	20..	June 26..	Aug 4....	Sept 3..	C P Gordon	309 Montgomery st
East Mt Diablo M Co	Nevada..	3..	05..	Aug 13..	Sept 17....	Oct 8....	G W Fisher	306 Pine st
Eureka Con M Co	Nevada..	5..	1.00..	July 26..	Aug 27....	Sept 17..	P Jacobus	309 Montgomery st
Justice M Co	Nevada..	39..	10..	July 9..	Aug 13....	Sept 3..	R E Kelly	419 California st
Mexican M Co	Nevada..	23..	50..	July 17..	Aug 22....	Sept 11..	C L McCoy	309 Montgomery st
North Gould & Curry M Co	Nevada..	5..	25..	Aug 9..	Sept 11....	Oct 1....	C H Mason	331 Montgomery st
Ophir M Co	Nevada..	45..	1.00..	July 28..	Aug 31....	Sept 20..	C L McCoy	309 Montgomery st
Potosi M Co	Nevada..	13..	50..	Aug 13..	Sept 17....	Oct 8....	W E Dean	309 Montgomery st
Savage M Co	Nevada..	56..	50..	July 19..	Aug 21....	Sept 10..	E B Holmes	309 Montgomery st
Sierra Nevada M Co	Nevada..	7..	77..	Aug 9..	Sept 12....	Oct 2..	E L Parker	309 Montgomery st
Union Con M Co	Nevada..	23..	50..	July 17..	Aug 20....	Sept 11..	J M Buffington	309 California st
Utah S M Co	Nevada..	45..	1.00..	July 20..	Aug 27....	Sept 14..	G C Pratt	309 Montgomery st
Virginia Con M Co	California..	10..	01..	July 24..	Sept 3....	Sept 24..	A F Benard	364 Howard st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Alexander M Co	Nevada..	2..	1.00..	June 20..	Aug 6....	Aug 27..	J K Warren	307 Montgomery st
Bald Mountain M Co	California..	2..	3..	June 26..	July 27....	Aug 30..	L Shannahan	125 First st
Campo Seco Copper Co	California..	2..	10..	Aug 10..	Oct 1....	Nov 20..	D Buck	309 Montgomery st
Como Eureka G and S M Co	Nevada..	1..	25..	July 23..	Aug 29....	Sept 18..	L Hermann	209 Sansome st
Eintracht G M Co	California..	12..	05..	June 12..	Aug 8....	Aug 27..	H Kunz	215 Sansome st
Excelsior Water and M Co	California..	5..	60..	July 6..	Aug 11....	Sept 3..	W J Stewart	220 Sansome st
Equitable M Co	Utah..	28..	25..	July 24..	Aug 31....	Sept 28..	C J Collins	512 Montgomery st
Golden Fleece Gravel M Co	California..	3..	50..	Aug 1..	Sept 5....	Sept 22..	F Schirmeier	785 Folsom st
Hazard Gravel M Co	California..	7..	14..	June 20..	Aug 16....	Sept 4..	J T McGeoghegan	318 Pine st
Homeward-bound M Co	California..	2..	25..	July 23..	Aug 27....	Sept 10..	S Bowie	314 Montgomery st
Homer M & M Co	California..	16..	10..	Aug 2..	Sept 8....	Oct 2..	F E Luty	330 Pine st
Lime Con M Co	Arizona..	7..	05..	Aug 6..	Sept 10....	Oct 6..	R D Hopkins	436 Montgomery st
Pittsburg M Co	California..	16..	10..	July 24..	Aug 28....	Sept 18..	R Wegener	414 California st
Roma Union M Co	Nevada..	2..	02..	June 18..	Aug 6....	Aug 27..	F X. Simon	518 Sansome st
Swansea M Co	California..	3..	25..	July 21..	Sept 1....	Sept 24..	M A Wheeler	119 Market st
Seaton G M Co	California..	3..	8..	July 31..	Sept 5....	Sept 27..	A Martin	525 California st
West Branch Feather River M Co	Cal..	1..	01..	July 16..	Aug 20....	Sept 10..	A B Paul	328 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Alaska M Co		A Judson	320 Sansome st	Annual	Sept 4
Arnold M Co		A Judson	320 Sansome st	Annual	Sept 4
Addenda M Co	California..	T H Dixon	238 Montgomery st	Annual	Sept 5
Liberty Hill Con M Co	California..	F E Luty	330 Pine st	Annual	Sept 6
Real del Castello M Co		A Judson	320 Sansome st	Annual	Sept 4
Villagrana M Co		A Judson	320 Sansome st	Annual	Sept 4

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Bulwer Con M Co	California..	W Willis	309 Montgomery st	15	July 2
Kentuck M Co	Nevada..	J W Pew	310 Pine st	10	July 19
Mt Diablo M Co	Nevada	R W Heath	318 Pine st	25	Aug 23
Navajo M Co	Nevada..	J W Pew	310 Pine st	25	May 14
Standard Con M Co	California..	Wm Willis	309 Montgomery st	25	Aug 12
Silver King M Co	Arizona..	J Nash	315 California st	25	July 12

Table of Highest and Lowest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Aug. 1.		WEEK ENDING Aug. 8.		WEEK ENDING Aug. 15.		WEEK ENDING Aug. 22.	
Alpha	1.80	2 00	1.70	2 30	2.00	2.50	2.00	2.40
Alta	.65	.70	.70	1.10	1.00	1.15	.60	1.05
Andes	.35	.70	.65	.90	....	.75	.70	.85
Albion	....	.35	....	.35	....	.05	....	.50
Argenta	....	....	.15	.25	....	....	.25	.55
Atlas	....	....	....	....	....	....	....	....
Belcher	.80	1.00	1 00	1.20	1.05	1.20	1.00	1.05
Belding	....	....	....	....	....	....	....	....
Best & Belcher	3.75	4.30	4.25	4.80	4.10	4.60	4.10	4.50
Bullion	.70	.80	.90	1.28	1.10	1.25	1.10	1.20
Bechtel	....	....	....	....	....	....	....	....
Belle Isle	....	.40	....	.40	....	.40	.35	.40
Bodie Con	.65	.70	.35	.45	.35	.40	....	.25
Benton	....	.15	.20	.25	.20	.25	.15	.20
Bodie Tunnel	....	....	....	....	....	....	....	....
Caledonia	....	.25	....	.25	.20	.25	.20	.25
California	.25	.40	.40	.50	.40	.45	.30	.40
Challenge	....	.30	.30	.40	....	....	....	....
Chollar	2.90	3.30	3.00	3.25	3.20	3.60	3.10	3.30
Confidence	1.55	2.00	2.00	2.25	....	2.20	2.05	2.25
Con. Imperial	....	.05	....	.10	....	....	....	....
Con. Virginia	.30	.40	.35	.50	.40	.70	.55	.65
Crown Point	.80	1.10	1.00	1.25	1.20	1.25	1.00	1.20
Day	.35	.55	....	.60	....	....	....	....
Elko Con	....	.25	....	.30	....	....	....	....
Eureka Con	4.80	6.00	5¼	6.00	5.50	6.25	6.00	6.25
Eureka Tunnel	.50	.53	....	.40	....	....	....	....
Exchequer	.40	.50	.45	.60	.60	.75	.55	.75
Grand Prize	....	....	....	....	....	....	....	.30
Gould & Curry	2.55	3.15	3.00	3.70	3.15	3.65	2.85	3.35
Hale & Norcross	6.00	6.50	6.00	6.75	6¼	6¾	6.30	6.25
Holmes	....	....	....	....	....	....	....	....
Independence	.45	.50	....	....	....	....	.50	.55
Julia	....	....	....	....	....	.15	....	.15
Justice	.10	.15	.20	.25	.30	.35	.30	.35
Jackson	....	....	....	....	....	....	....	....
Kentuck	....	....	....	....	....	....	....	....
Martin White	.20	.25	....	.30	....	.25	....	....
Mono	....	....	....	....	....	....	....	....
Mexican	2 30	3.25	3.35	4.10	3.20	3.75	3 35	3.80
Mt. Diablo	5.00	5.50	....	5.00	....	....	6.25	6.50
Mt. Potosi	....	....	....	....	....	....	....	....
Nooday	....	....	....	....	....	....	....	....
Northern Belle	6.75	7.25	....	6.75	....	6.50	6¼	6¾
North Noonday	....	....	....	....	....	....	....	....
Navajo	3.10	3.25	3.10	3.25	....	3.15	2.60	3.20
North Belle Isle	....	.40	....	.40	....	.40	....	.40
Occidental	1.70	1.75	....	1.80	....	1.70	....	....
Ophir	2.40	5.00	3.85	4.20	3.50	4.15	3.05	3.95
Overman	.30	.40	.35	.50	....	.40	.40	.45
Oro	....	....	....	....	....	....	....	....
Potosi	1.10	1.40	1.25	1.35	1.20	1.40	1.15	1.30
Pinal Con	....	....	....	....	....	....	....	....
Savage	1.80	2.20	2.05	2.25	2.05	2.40	1.85	2.55
Seg. Belcher	....	3.00	....	3.00	....	....	....	....
Sierra Nevada	3.85	4.25	4.20	6¼	4.35	4.70	4.2	4.70
Silver Hill	....	....	....	....	....	.10	....	.10
Silver King	....	6.50	....	....	....	6.90	6.50	6.50
Scorpion	.60	.90	.70	.85	.60	.70	.55	.65
Tuscarora	....	....	....	....	....	....	....	....
Union Con	4.70	5.00	4.95	6.50	5.00	5.75	5¼	6.25
Utah	2.20	2.20	2.50	3.35	2.50	2.95	2.00	3.20
Ward	....	....	....	....	....	....	....	....
Wales	....	....	....	....	....	....	....	....
Yellow Jacket	2.80	3.05	2.95	3.65	3.30	3.55	3.05	3.55

Sales at San Francisco Stock Exchange

THURSDAY A. M., Aug. 23.

100	Alta	85c	
50	Alpha	2.15	
100	Andes	70c	
100	B. & Belcher	4¼	
100	Belcher	1 05	
220	Chollar	3.10@3.15	
600	Con. Virginia	62½c	
250	Gould & Curry	3¼@3.15	
250	Hale & Nor	6¾@6.05	
230	Mexican	3.52½@3.60	
140	Ophir	3.05	
470	Savage	2.45	
300	Sierra Nevada	4.30@4.35	
400	Union	4¼	
100	Yellow Jacket	3.30	
	AFTERNOON SESSION.		
150	Alta	85c	
200	Belmont	1.10	
100	Bodie Con	35c	
925	Chollar	3.05@3 15	
950	Con. Virginia	55c@60c	
350	California	40c	
10	Confidence	2.15	
200	Day	50c	
100	Eureka Con	6½	
675	Gould & Curry	3	
750	Hale & Nor	6@6¼	
450	Mexican	3.15	
50	Mt. Diablo	4.90	
25	Navajo	2½	
200	N. Belle Is	35@40c	
490	Ophir	3.35@3¾	
100	Overman	35c	
130	Potosi	1.25	
875	Savage	2@2.05	
955	Sierra Nevada	6.40@4¼	
400	Scorpion	60c	
100	Senator	20c	
25	Silver King	6¾	
100	Tiptop	30c	
180	Union Con	4.95	
30	Utah	2.50	
100	Yellow Jacket	3.25	

JAMES KEENE, the bear of Wall street, is credited with making $5,000,000 during the past three weeks by the fall in stocks.

Mining Share Market.

The festivities now going on in the city seem to have drawn away what little attention there was being paid to stocks, and the business is very dull. In the mines all has been eventless. During the past week dead work has been the rule all along the Comstock lode. At the Chollar-Norcross-Savage shaft they were delayed by the breaking of a pump rod and bob pin for such a length of time that the water rose to such a height above the 2600 station as to drown the west drift leading out to the Hale and Norcross on that level. Though this accumulation of water will now soon be pumped out, it will leave the 2600 level dirty and hot, and for some days work will be carried on there to a disadvantage.

At the Union Con. mine, during the past week, not much was done on the 3000 level at drifting. The principal work has been the timbering up of the main west drift.

At Gold Hill all mining operations are badly crippled on account of the low stage of water in the Carson river, which prevents the crushing of ore. This trouble will not end till the fall rains set in. Meantime about all that can be done in the mines is exploring and prospecting work.

Bullion Shipments.

Ontario, 15th, $12,328; Horn Silver, 16th, $45,000; Ontario, 16th, $3,947; Hanauer, 16th, $4,300; Stormont, 16th, $2,270; Nevada, 16th, $1,160; Hanauer, 18th, $3,300; Horn Silver, 18th, $12,000; Ontario, 18th, $8,195; Mt. Diablo, 14th, $7,446.

THE PACIFIC BUSINESS COLLEGE.—A conflagration a few days ago destroyed the building in which the Pacific Business College was located, and turned the well-known principals and their many pupils out from their accustomed quarters. The principals, Profs. Chamberlain and Robinson, were, however, (quite equal to the emergency, and, securing temporary rooms at the Synagogue, Mason street, between Post and Geary, they resumed business and instruction with but the loss of a single day. Viewing the institution to-day, actively at work, no one would think it had suffered a whit from the conflagration. It will coutiuue in its present location, probably, until it ean return to its old and delightful quarters opposite Union square Messrs. Chamberlain and Robinson deserve great credit for the vigor and alacrity with which they righted their institution after the disaster, and they should be encouraged and supported by a generous patronage from those who appreciate the practical and business-like education which they give their pupils.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in eirenlating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $4 a year, in advance. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times,) by turning a leaf.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

JACKSON.—*Ledger*, Aug. 18: Harvey Clark is hauling rock from this mine to the Oneida mill to be crushed. There are about 150 tons on the dump at present. Two or three men are employed underground, in taking out ore.

MAMMOTH.—Everything but water is ready to commence operations. The upper tunnel is in 600 ft. The contractors have just completed a contract of 300 ft, doing the work in just three months. There is yet a distance of 400 ft to be run before getting under the big shaft.

SUTTER CREEK.—All work at the Mahoney mine was suspended on Saturday morning last, owing to the refusal of the employes to work until wages due were paid. By express understanding when work was resumed two or three months ago, the employes were to be paid off regularly every month. The last payday should have been on the 10th. The day passed and they quit in a body. The company is behind about $5,000 on this last deal.

KENNEDY.—*Dispatch*, Aug. 18: The old Kennedy mill has been put in order again, and was started up last Monday, on rock from the mine of A. Pharis, which is located a short distance from the mill.

CONFIDENCE.—The 10-stamp mill recently erected on the Confidence mine, near the Mokelumne river, commenced running five stamps last Thursday on rock from the mine. The rock has every appearance of being unusually rich. The mine is owned by Messrs. Hagerman, Matson & Fleming.

NOTES.—The Amador Con. looks somewhat encouraging. Stringers of quartz coming in the bottom indicate ore. The Iowa is in full blast, but have not yet got off a heat. The Lincoln is still dormant with little hope of reviving.

Calaveras.

WEST POINT.—*Chronicle*, Aug. 18: The mines are booming. New machinery and buildings are being put up. The ores continue rich. Mr. Desmond, of Sandy gulch, has struck a new ledge, extensive and rich. Fischer's large, eight-mule teams are hauling the mill and machinery formerly owned by Mr. Bicknell at Whisky Slide, to the Star of the West mine, where it is being put up. Mr. Haskins informs me that they have got through the hard easing, and that the propects look more favorable.

NEW COMBINATION.—The work of running the incline tunnel at the New Combination mine has been commenced. The incline will be 268 ft in length with a grade of 3 ft to 12 ft. The mine at present is running full handed and the outlook is encouraging.

MARCHAL.—*Mountain Echo*, Aug. 15: We visited the Marchal mine on Monday last, and found everything in first-class order. The machinery runs with the precision of clock-work. The shaft has reached a depth of 185 ft. Capt. Cushing, the superintendent and one of the owners, seems well pleased with the outlook.

El Dorado.

GRIZZLY FLAT.—Placerville *Republican*, Aug. 16: The south extension of the Mt. Pleasant and Melton leads are soon to be thoroughly prospected. At present the Melton and Mount Hope mills are running but half the time owing to the scarcity of water; the latter in daytime and the former at night.

BLAIR GRAVEL CLAIM.—Placerville *Democrat*, Aug. 18: Work at this mine is being vigorously prosecuted, and the prospect is better than ever. All the men in the neighborhood are kept employed, and John Blair, who is devoting his time to the work, tells us that the force will be increased from time to time.

Mariposa.

BANDERITA MINE.—*Gazette*, Aug. 18: The main tunnel striking the vein at right angles is 1,430 feet long. At the head of the tunnel a stope of 160 feet shows a five foot vein, a portion of which is good milling ore. From the head of the tunnel 450 feet westerly, a drift is cut upon the vein. At the end of this drift, stoping is commenced, which is immediately under the old whim shaft 450 ft above. Good ore is taken from this stope. Twenty-five men are engaged at the mine. Good milling ore is rapidly accumulating on the dump and the mill will be started in about two weeks.

Modoc.

HAYDEN HILL.—Reno *Gazette*, Aug. 14: The Adin *Argus* of the 9th says: Messrs. Frank, Lacert & Burgett, who worked the Hayden Gouge, have been troubled for air in their main tunnel. To supply this they commenced sinking a shaft to intersect the tunnel. There was no expectation of striking pay in this shaft, but on Monday last the dirt thrown out looked so encouraging that a horn full was washed. The happy miners discovered that the dirt which they were throwing away was worth from $1,000 to $5,000 per ton. Pay dirt commences at a depth of 35 ft; the vein is 2½ ft in width. On the flat, south of the hill, nothing of value has ever been discovered previous to last Thursday. On that day Driscoll & Stearns struck a 14 inch vein of ore, which prospected from $20 to $80. On the following Saturday they uncovered ore, which will pay $250 per ton. After this last strike business began to get tropical at Hayden hill. Recorder Height was kept busy night and day. On last Monday night claimants with lanterns were staking off claims during the entire night, and what adds fuel to the flame is the fact that two of these, Silvers & Dunn, yesterday struck $60 dirt at a depth of only three ft from the surface. In many of the claims, miners have quit working for wages, preferring to prospect for themselves. We hear that the miners in the Juniper claim are taking out dirt that runs as high as $20 and $14 per pound.

Nevada.

MEADOW LAKE.—*Transcript*, Aug. 17: On our visit last week to those ruins of the good old times, we saw about 50 dilapidated old houses, and met a dozen miners still holding on. W. H. Ware and H. H. Hartley are apparently the principal owners of the mines there. With them we visited the mines known as the Pacific, Knickerbocker, Excelsior, Pittsburg and Empire. In any of these mines are found plenty of free gold specimens, and some show quantities of ore seemingly exhaustless. Mr. Hartley considered the average value of the ores to be from $20 to $25 per ton. He was one of the original locators, and did not expect to give up the ship without his pile. Sixty thousand dollars is his price for his four patented mines. If any system of working the ores could be discovered, the excitement over Meadow Lake would be as great as in her palmy days. The dam built by the South Yuba Canal Co. at the foot of the lake, at a cost of $75,000, is still standing. The mines are 24 miles from Truckee and eight miles south of Webber lake, the wagon road being as good as when first graded.

NEVADA CITY MINE.—A rock breaker has been received for the mill of the Nevada City. The 10 inch plunge pump, heretofore reaching only to the 400 level, is being extended down to the 600, and sinking for the 700 will soon begin. The ledge continues to produce well from the 400 and 600 levels.

BIG CLEAN-UP.—*Herald*, Aug. 14: We learn that a clean-up of $110,000 was recently made in the Manzanita hydraulic mine, at Sweetland, after a run of 41 days. This is an offset to the entire season's crops of half the ranches in the sickens fields.

MURCHIE MINE.—Grass Valley *Union*, Aug. 15: For the past two weeks the old Murchie mine has shown a marked improvement. On the 400 level they have struck a 3-ft ledge which is very heavily charged with sulphurets, and shows considerable free gold. One crushing had from it in 24 hours' run, exclusive of the free gold, yielded 1,800 pounds of sulphurets that will go from $300 to $400 per ton. Sixty-five men are employed.

GRANITEVILLE.—*Transcript*, Aug. 18: Quartz mining in the vicinity of Graniteville has been giving better returns of late. The Rocky Glen mine, owned by John Hippert, is producing right along. Enough ore is extracted to keep the ten-stamp mill going 16 hours a day. The yield approximates $8 a ton, which gives a fair profit for working. A deposit of ore that looks as if it would pay $20 a ton, has been found in the California mine, and the owners have determined to secure the old Birchville ten stamp mill, put it up on their claim, and begin systematic operations. A company is taking out some first rate ore in the southern edge of town, and crushing it by arastra.

Placer.

MORNING STAR.—*Herald*, Aug. 18: Hawkins & Peardon of the Morning Star Quartz mine, made another shipment of bullion this week, the clean-up after about 25 days' run and from 125 to 130 tons of ore, which aggregated an amount equal to between $20 and $25 per ton. This same ledge was once worked by a corporation, and they closed down, because they couldn't make it pay.

Plumas.

RIVERDALE.—Quincy *National*, Aug. 18: This mine is now ready for action, and if no accident happens will show bedrock in from thirty to forty days. The machinery, which was purchased in Virginia, Nev., is splendid. The Blake steam pump, 12-inch cylinder, shows itself capable of handling three times the water which will be found. On Wednesday, the shaft, which is six by twelve feet, had fourteen feet of water in it, and the pump, running at one-third the speed of which it is capable, drained the water in less than fifteen minutes. There is every reason to believe this mine will be a success, as it is in the hands of men who have the means, and who know how to operate it. The depth to bedrock will be about one hundred ft.

CLAREMONT PEAK.—The tunnels are progressing as fast as the men can drive them. Some fine prospects give the owners much encouragement, and the gravel now being cut will pay three dollars to the car-load, if not more.

MAGALIA RIDGE.—Oroville *Register*, Aug. 16: New machinery for the Pershbecker mine is being put up. New and heavier pumps are being placed and the pumping and hoisting works are to run by steam power. At the Meredith mine good prospects are being uncovered. The Fred. Lang mine is in full blast. They have struck the bedrock at a depth of 104 feet, and are now searching for a channel. At the Indian Spring mine machinery is being erected for crushing the hard cement. This will pay from $40 to $60 to the ton. Austin Parish has found a good prospect at the Miocene flume, where it crosses his land. John Bear has a good prospect near where his old diggings gave out. He has been getting $2 to the pan. The Mineral Slide has shut down for the present. Nothing is being done at the Tom Neal diggings, as there is no water. The mine depends on rain principally. Parties running a tunnel on the Little West Branch, near the Tom Neal diggings, hope to find a channel of gravel. We hear that good diggings have been found near the Hendricks head dam on the West Branch.

San Bernardino.

GOLCONDA.—Calico *Print*, Aug. 18: Recent prospecting has resulted in the taking out of good ore in a half dozen places, but also in the discovery and opening of a ledge from 4 to 6 ft in width in the south end of the claim. Some of the ore assays as high as $7,000 to the ton, but the average assays give a little over $200 to the ton. The strike is the best that has occurred in East Calico for a long time. Four men are now at work, but as soon as practicable the force will be increased. There are 25 tons of ore on the several dumps that will be taken to the mill shortly.

NOTES.—John Anderson, of San Bernardino, has bought Robt. McCullough's interest in the Pinto. Keys and McGlinchy are working on the Cuba, No. 1. Another tunnel has been started in the Garfield below the one that now intersects the ledge. The amount of rich ore that is taken out is increasing as the work progresses. Work on the Taggart mine is still in ore. Operations on the Bismark continue. The usual force of men are engaged in the Oriental. The mine looks as well as ever. The King mine is sending to the mill the usual quantity of ore, and the amount of reserve ore is being increased. This mine is making an excellent record.

ALVORD.—San Bernardino *Index*, Aug. 18: The new Huntington mill for the Alvord mine is up and nearly ready for running. It will crush 10 tons a day. As the lowest estimate puts the Alvord ore at $20 a ton, and the working expenses cannot exceed $10, a profit will be made from the start.

ORO GRANDE.—The Oro Grande M. and M. Co., under which the Silver King, of Calico, is managed, held a meeting at Los Angeles yesterday, and de-

clared a dividend of $24,000 for the month ending August 14th. This is an increase of $8,000 over last month, and makes a total of $40,000 for the two months.

San Diego.

THE LOWER CALIFORNIA PLACERS.—San Diego *Union*, Aug. 14: Mr. G. Caravta showed us yesterday three beautiful specimens of placer gold, weighing an ounce or more each. Thirty ounces of this were brought up from the placers near the gulf side of the peninsula by a party of Mexican miners, who made the trip up overland in 14 days. They say there are 400 people, mostly Mexicans, at the mines. There is no water nearer than 40 miles for mining purposes, and the gold is obtained by dry washing. One nugget was obtained weighing over 5 pounds. The name of the camp is Canada, 45 miles from Gertrudes, and 500 miles south of San Diego.

Shasta.

NOTES.—*Courier*, Aug. 18: Arbuckle miners are jubilant on account of the good clean ups made there recently. Almost all of the miners have suspended work for the season, owing to the scarcity of water, yet the miners on South Fork will continue to get out ore and crush it in their arastras.

AFTERTHOUGHT.—It is stated that the Afterthought mill will soon be shut down and the mill and mine offered for sale. The owners are not familiar with mine and mill management, but the paying ore is there.

Sierra.

NORTH AMERICA.—*Mountaineer*, Aug. 11: The North America mine at Hepsidam, in this county, is a drift gravel mine, and for a long time the owners have employed Chinese as breasters. Recently the workmen thought they had cause for dissatisfaction, and quit in a body. A back channel was recently discovered, and the prospects are so good that the owners have decided to replace the striking Chinese with white men. The tunnel of the company is now some 4,000 ft long.

SOUTH FORK.—This company has just declared $309 dividend to an interest. They have put in a tail flume. The Bald Mt. Extension will resume work to-night. The Extension Co. took out 136 ounces last week, leaving over 100 carloads of gravel in the dump.

MAXSON LEDGE.—Downieville *Messenger*, Aug. 18: Capt. Mead of Oakland, arrived in town Wednesday, with the money to conclude the purchase of the Maxson ledge, Pig canyon, for $5,000. He has associated with him a gentleman by the name of Blood, and they propose to thoroughly develop the property. The ledge is from 4 to 5 ft wide and prospects well throughout.

FOUR HILLS.—A shipment of rich rock from the Four Hills came down last week, and there was all that a mule could pack. The invoice valued the rock—or rather gold, as there was more gold than rock—at $100,000.

RAINBOW.—Work has been commenced on a new tunnel at the Rainbow mine, starting as low down as possible. It is reported that the mill will have to be removed lower down when they begin to take out ore.

EXCELSIOR.—N. B. Fish has purchased an interest in the mining claims at Excelsior of Jas. Patterson, and moved up there to commence work. They will open the old St. Lawrence claims among the first.

KALAMAZOO.—The Kalamazoo mine, in Mohawk, is in bad luck. The mine owners got a shaft down 125 ft, when they encountered water. Then they let a contract at $3 per ft to sink a double shaft. A pump was procured, but it did not come; a man was sent from Reno to see what was missing. When all was ready, something fell down the shaft and broke the pump; and the result is that very little progress has been made this summer.

THE MINING OUTLOOK.—Sierra *Tribune*, Aug. 16: W. A. Skidmore, Secretary of the Miners' Association, has returned to San Francisco from a tour of the principal mining counties. His trip covered 20 days and an area of 1,000 miles in the counties of Sierra, Yuba, Plumas and Nevada. He states that, considering the shortness of the water season, the snow fall being exceptionally light, the mining prospect is bright. The snow lies only on the mountain peaks and there in patches, Pilot peak, in Sierra county, being the best covered. The recent discovery of the Four Hills mine in this county, he looks upon, from personal examination, as the greatest made since that of Bodie. The famous Sierra Buttes mine will shortly have an additional mill of 80 stamps in operation. The great hydraulic mines, which are suspended by injunction in the impending debris suits, are the Excelsior, at Smartsville, the Gold Run, above Auburn, and a prominent mine near Oroville. There is at Brandy city an unprecedented yield of the precious metals by the hydraulic process, Mr. Cadwalader's pocketful of injunction suits having given out far this side of that point. There are signs of decadence on every hand as the effect of the debris injunctions. But for such the hydraulic companies would be running bedrock tunnels and pushing many fresh enterprises. But outside of hydraulics the mining interest throughout the region stated is an enormous one and prosperity is everywhere apparent.

Trinity.

DEADWOOD.—*Journal*, Aug. 18: Frank Ballou, the veteran quartz prospector of Northern California, a man who has found more rich ledges than anybody and who knows how to look for them, has a big thing at Deadwood. His lode is 12 inches in width and the rock goes $100 to the ton. Another prospector in that district known as "Frenchy" recently found a good ledge right in the wagon-road and is running a tunnel on it. The surface rock is very rich and the lode well defined.

MORE QUARTZ.—From Mr. A. P. Haskins, of Trinity Center, we learn that that section is excited over recent quartz discoveries reported rich. Allison & Dean have splendid prospects from a ledge they found on the head of Hall gulch, while some sheep men exhibit rich specimens from a lode on Swift creek.

NEVADA.

Washoe District.

BEST AND BELCHER.—*Enterprise*, Aug 18: No work is being done in the drifts on the 2500 level at present, as they are waiting for the water to drain out. The ground is very wet.

UNION.—During the week the work has principally been at timbering the main west drift on the 3000 level. Day before yesterday however, work was resumed in the north drift, and it is now being advanced in vein material.

HALE AND NORCROSS.—No work can be done until the water has been lowered at the Chollar-Norcross-Savage shaft sufficiently to leave the west drift on the 2600 level clear.

SCORPION.—The west drift on the 500 level is in ground of a favorable character much more promising than any found to the east.

CON. VIRGINIA.—The joint California drift on the 2800 has been run out into a patch of wet ground, that was giving trouble in the winze, and the water caught up. The south drift on the 2700 level is making the usual progress.

ALTA.—At this mine they are now about ready to begin the work of pumping out their lower level.

CALIFORNIA.—The joint drift from the C. and C. winze, on the 2800 level, has been run in a sufficient distance to tap the water that was giving trouble in the winze.

SIERRA NEVADA. The main north drift on the 2900 level is making good headway, as is also all the work joint with the Union Con.

OPHIR.—On the 150 level are drifting west to get into the old vein. The vein at this depth has a western dip. Ore is still being extracted from the croppings.

SAVAGE.—The work of crossentting will be commenced on the 2600 level as soon as all is again progressing favorably at the Chollar-Noreross-Savage shaft and Hale and Norcross.

MEXICAN. Very fair progress is being made in the raise going up from the 2900 level, though the rock is quite hard. The north drift on the 3100 level is making rapid progress.

ANDES.—The large amount of quartz now being found promises well for ore.

YELLOW JACKET.—A considerable amount of ore is still being extracted from the old upper levels, and men are kept at the work of exploration.

GOULD AND CURRY.—Good progress is making in east crosscut No. 2, on the 2500 level. It is in a vein of porphyry of a favorable character.

CHOLLAR.—No further prospecting will be done on the 2600 level until the new hydraulic pump is completed.

UTAH.—Good headway is making in the north drift on the 1350 level.

UNION SHAFT.—Are still making repairs to the 2300 station.

Belmont District.

LAITY.—*Courier*, Aug. 11: Official report of Supt. Fassett: Level in Laity ground has been extended during past week 25 ft, making total length of level in ore 147 ft, the ledge holding its width and showing on its face splendid chlorides. Moore & Martin's ground is improving in quality of ore as we go south. Knight's ground yielding very high grade ore and the ledges much stronger than last week. Crosscut in South Tunnel still in very hard rock.

Candelaria District.

NORTHERN BELLE.—*True Fissure*, Aug. 18: The southwest drift on the fifth shaft level has been advanced ten ft during the week. Its total length is 192 ft. The crosscut to the south on the same shaft level has been extended 11 ft. The stope on the fourth shaft level is producing ore of excellent grade; the main drift being in the same body of sulphurets as last reported. The total production of ore from the mine has fallen off materially within the past two weeks, so that the running of mill No. 2 has been reduced to half time. The present yield of ore is 38 tons daily. All the work of prospecting is being pushed vigorously in every direction. The bullion shipments for the week ending August 16th amounted to $7,777.43, and aggregate $17,969.68 on August account to the same date.

MOUNT DIABLO.—The drift below the stope from lower winze No. 2 shows a strong ledge of low grade ore, while the stope above this drift is giving some $60 ore, and the ledge is improving in appearance. The stope near winze No. 1, below the third level, is yielding a little $50 ore. The stope above the third level, near winze No. 4, is giving some $200 ore from small bunches. The stope above the west drift from the Callison winze is not looking so well, but shows a little improvement in the center, and is yielding considerable ore assaying $75 per ton. Two bullion shipments were made during the week, one of $6,650.78 on the 9th instant, and another of $7,441.63 on the 13th.

Esmeralda District.

MT. CORY FIRE.—Esmeralda *Herald*, Aug. 18: News reached this place on Thursday last about 1 P. M. that the boarding and lodging houses of the Mt. Cory Mining Co. at the site of their reduction works, had been destroyed by fire about noon of that day. Since writing the above, in consequence of the fire, we visited the site of the reduction works. Everything has a business appearance, and we were surprised at the progress made in the construction of the works. The superstructure will be an immense one, strong and durable.

Eureka District.

SECRET CANYON.—*Sentinel*, Aug. 18: A piece of rock was found a few days ago in a crevice in the Water Jacket mine, which adjoins the Page & Corwin in Secret canyon, that assays $924.61 per ton in silver, A number of other samples are to be assayed, and if they prove valuable, work will be commenced.

Humboldt District.

COVE MEADOWS.—Reno *Journal*, Aug. 18: The copper mines recently located in Cove Meadows district, Humboldt Co., are said to be extensive. The locators are from Surprise Valley and Alturas, California. Patterson, Clark and Haynes have eight or ten miners at work on one of their copper mines, which is from twelve to fifteen ft wide. They intend to take out a thousand tons of ore before erecting smelting works.

Tuscarora District.

ELKO CON.—*Times-Review*, Aug. 16: Since last report, shaft No. 2 has been placed in good order. Started up machinery for permanent work yesterday, the 15th inst, and resumed sinking to-day.

GRAND PRIZE.—West drift, 300 level, extended 21 ft; total length 53 ft. The vein is 12 inches wide, showing good ore in spots, and looks promising. South drift, 400 level, extended 14 ft, total length 93 ft. The ore produced is high grade.

ARGENTA.—Since last report north crossent 400 level extended 11 ft; total length 24 ft.

BELLE ISLE.—On the 450 level the north drift has been extended 14 ft.

NORTH BELLE ISLE.—Contractors have encountered favorable ground and good progress has been made in the drift south on the 300 level.

NAVAJO.—The station at the 650 level is being cut out as rapidly as possible. The compressor is on the ground, and will be running soon.

INDEPENDENCE. In the drive south on the 400 level, we have made fair progress. Total length of drift 944 ft.

ARIZONA.

SILVER KING.—Pinal *Drill*, Aug. 14: Silver King is now lively. The King mine is down 900 ft vertical, including the old works. They have laid surface pipe 600 ft connecting with the water tanks. All the property of the company is within reach of three great streams at any moment, and the ventilation in the mine is perfect. The mine is looking as well as ever. There are no known bounds to the ore body. The mill runs constantly and is in better shape than ever. They run 12 tables, 20 stamps and work up 60 tons per day in concentration.

PINE SPRING.—*Courier*, Aug. 10: The ten ton shipment of silver nuggets and rich ore from the Pine Spring mine ought to open the eyes of sleepy San Franciscans. It will be in the city in about 12 days. Mr. Austin, who arrived recently from the mine, assures us that $100,000 is a small valuation to place upon the stuff that has been taken out of the shallow shaft. The extension on the Pine Spring known as the Cash Entry has five ft of ore which has sampled $274.45 to the ton.

BIG BUG.—The Silver Belt mine, Big Bug district, is still in bonanza. From 30 to 35 men are employed in and around the mine. An average of 120 tons a month is being shipped to Pueblo, Colorado, for treatment. The rock is rich, easy to work and should be treated at home. G. W. Bowers & Co. are doing well with their Chip mine and mill. The south extension has just been sold for $5,000. New York people have just purchased the Deposit mine. Yuma county, for $18,000.

COPPER.—Prescott *Miner*, Aug. 10: Mr. Murray, one of the owners with Governor Tritle in the United Verde property, informed us to-day that the smelter was working like a charm, yielding eight tons of copper bullion per day. On the 6th inst., the company shipped 24 tons, the result of three days' work.

AROUND HOWELLS'.—The Belle furnishes all ore necessary for the smelter. The amount of bullion produced daily is about five tons, worth from $400 to $800 per ton.

COLORADO.

GUNNISON.—Georgetown *Miner*, Aug. 4: The Legal Tender, at the head of Tonichi creek, shows 30 ft of solid ore at the bottom of a 60-ft shaft. It runs from 50 to 100 ounces and a 12-ton carload is shipped every other day to Canyon city. Mr. Johns, formerly of the Grant smelter, at Leadville, says the vein is the largest for high-grade ore he has ever known in Colorado.

TELEPHONE.—A mill-run from the Telephone lode, T. J. Cantlon & Co., owners, returned last week for first-class 704 ounces silver and 30% lead per ton. The second class ran 75 ounces. A 2,500 pound lot, first and second class, netted over mill charges, $645.62.

VULCAN.—The stope beginning 100 ft east of the Egan tunnel is now 180 ft long and no where over 30 ft high, with about 270 ft above that to raise on. There is ore the entire distance varying from two to twelve inches in width. It consists of sulphurets, and high grade galena. The last mill run of three tons returned for first-class 476 ounces, second class 216 ounces and 23% lead.

BIG CHIEF.—Twelve men are running three shifts daily on the Big and Little Chief drifts. The former is in 110 ft, the latter 50. The Big Chief crevice at the creek is 100 ft wide, and prospects well in gold. Twenty thousand dollars has been paid down towards the mill. Two Germans, a Lutheran minister and a brewer in the east, worth millions, are reported to be at the head of the enteprise.

BIG STRIKE.—A new district ten miles southeast of Chicago creek was prospected last week by Billy Man and another. They made four locations, some specimens from which, returned respectively 327, 107 and 100 ounces silver. The lodes begin right at grass roots, and one of them has a crevice 20 ft wide.

LITTLE ALICE PLACER MINE.—A gentleman from Silver City showed the mining reporter several pieces of native silver taken out of the sluice boxes on the Little Alice placer claim. This mine has been considered more of a gold than silver producing property, and this find naturally leads one to the conclusion that there is a belt of silver veins passed through that section. The finding of these nuggets has created quite a sensation and a number of prospectors are at work.

WILL PAY NOW.—Large quantities of ore are now coming out. Low grade stuff, running from 25 to 60 ounces, which in the early days was thrown away as worthless, yields a profit now. Old stopes are being re-opened and old dumps sorted.

NOTES.—*Miner*, Aug. 11: A party of lessees on one of the prominent mines at Georgetown, had a run of a lot of ore last week, which gave $1,120 first-class, and $346 second class, per ton. The Paymaster lode at Decatur, Mr. Sam. Roberts reports to be producing 15 tons per week assaying 64 ounces silver and 70% lead. The Ben. Dare lode is a new discovery in Cotton Wood gulch. It shows a well defined crevice and is claimed to be an extension of the Swiss lode. Assays of the surface quartz ran as high as $120 silver and gold.

IDAHO.

LITTLE SMOKY.—Ketchum *Keystone*, Aug. 9: The Silver Star and Salamander mines, on Little Smoky, have been sold to the Philadelphia Co. of this place, for cash $51,000. The Silver Star is developed by two 100-foot shafts about 100 feet apart and a shaft of less depth about 500 ft from the first, all on the ledge, which is thus shown to be continuous. The vein is large, averaging six feet in width.

SILVER KING.—The Silver King mine, in Beaver gulch, Sawtooth district, has been sold to Matthew T. Scott, of the Davitt, for $125,000. It has produced about $40,000 worth of milling ore, most of which now lies on dump. This ore averages in value 100 ozs., and often contains large samples worth 400 ozs. per ton. The mine is but a few miles from the mill of the Columbia and Beaver Co. It is easily accessible.

NOTES. The Queen of the Mountains is developing handsomely and has paid expenses from the start. Harry Hill, the Supt, informs us that ten or fifteen tons are ready for shipment to the Philadelphia smelters. The Idaho now looks better than ever, and is producing more than enough to pay development work. At Vienna Mr. M. K. Evans of Ketchum, is developing the Vulcan and Mary Graham lodes, the latter of which he has bonded. The Vienna mill continues to run without cessation. It has not been shut down once since starting. James Davison is preparing to ship fifteen tons of high grade ore from the Pride of Idaho on East Fork. The O. K., at Bullion, is shipping large quantities of high grade ore to the Philadelphia smelters here.

SAWTOOTH. *Times*, Aug. 8. John Church, who has been working three months on a prospect, has struck a foot and a half of ruby and native silver. The name of his location is the Silver Eagle, and the strike has created a sensation. There is a greater number of prospectors in the hills about Sawtooth, than at any former time. Matt. Hannan is extracting very rich black sulphurets of silver from the Mountain View. Col. Brodhead and George Griffith are having rich black sulphurets and brittle silver ore, averaging 800 ounces to the ton, taken out of the Scotia mine. They have 12 tons of this ore on the dump.

MONTANA.

NORTH PACIFIC EXHIBIT.—Butte *Miner*, Aug. 8: A *Miner* reporter yesterday inspected at Caplice hall the collection of specimen ores, gathered in Summit Valley district, for the Northern Pacific exhibition cars, and there seems to be little doubt that in their exhibits from place to place throughout the United States and probably in Europe, more real benefit will accrue to our mining interest, than could be derived from any other exhibition of ores in which Montana has ever been represented. Then follows a list of some 25 contributing mines, with the assay value and the composition of each specimen in silver, gold, and copper. The silver showing is from 100 to 2,500 ounces per ton.

ANACONDA.—The Anaconda Co. is pushing work on the concentrator and smelter—the largest enterprise of the class in the United States. An express is run twice a day to the Warm Springs station, and visitors from Butte and Deer lodge crowd the streets.

BOWLDER.—Helena *Independent*, Aug. 9: The Bowlder mine near Basin city, owned by an Indiana Co., has during the last three months under a lease paid handsomely. Some of the ore ran as high as $40 per ton in gold saved in the mill, and still the principal value of the mine product is in silver. The lease expired on the first instant and the corporation now contemplates changing their mill so as to enable them to save the silver. At present it only saves gold.

NEW MEXICO.

MONASKA MINE.—Kingston *Tribune*, Aug. 9: There are between 60,000 and 70,000 pounds of ore at the Monaska mine, already sacked and awaiting shipment, besides large quantities in the sorting room awaiting sacks. Some five or six tons of ore have already been shipped. The 1st, 2d, and 3d levels are in very rich ore. As an example the output of ore was, in one instant last week, 180 sacks of ore in two shifts, the ore assaying from 400 to 12,000 ounces per ton. The bottom of the shaft is in rich ore, but sinking has been suspended awaiting the arrival of pumps—which are on the way—the water coming in so fast that work could not be prosecuted to advantage. Twenty-four men are employed on the mine. The hoisting machinery is working finely.

SILVER MONUMENT.—One hundred and seventy-two sacks of the richest looking mineral yet mined in the Apache district has been taken from the Silver Monument mine since the last shipment. The first shipment milled $1.40 in silver; the last gave $240, and the ore on the dump now ready for shipment is expected to yield $500 per ton. The shaft is now about 130 ft deep.

OREGON.

CALUMET MINING CO.—*Oregonian*, Aug. 14: The Union *Record* says: Sol. Center, superintendent of the Calumet, has been making preparations for working the ledge, and for opening a trail to the same. This great copper mine, doubtless the richest and most extensive ever discovered, is in the Granite range, 30 miles east of Union, in Union county, and was discovered in 1879. The company has secured M. F. Holbrook, an old pioneer and practical mountaineer, to locate the trail. The work of developing the mine will be carried on energetically. Mr. Center daily expects eight or ten practical miners direct from Lake Superior, who will at once be put to work, and should the mine turn out as expected, at least 200 men will be employed there this fall.

UTAH.

SOUTHERN UTAH.—Cor. Salt Lake *Tribune*, Aug. 15: A rich find has been made in the mountains near St. George. A ton or more of ore is on the dump, some specimens ranging as high as $130 in silver. Before drifting 20 ft, a two ft vein was struck. A shaft 87 ft has been sunk in this. A drift 20 ft deep has been run horizontally into the hanging rock. This ends in the vicinity of a cave, exhibiting a high grade of carbonate ore. Prospecting is done by contract. Gillispie, Lund & Co., of Silver Reef, are developing this claim. Watson M. Nesbit is the manager. The merit of the discovery is due to him. Ten full claims designated the Mammoth mine, have been entered. This lies in the center of the Beaver Dam Mining district, bordering on Nevada on the west. Twenty-five miles from St. George and 12 miles south of Santa Clara river, a rich copper mine has been discovered.

Working Placer Mines Where Water is Scarce.

A correspondent of the *Mountain Messenger* (Sierra county, Cal.) writes as follows:

I had heard of a wonderful self-acting dam in operation in Davis' ravine, up the North Fork, about six miles above town, built by Abraham Moser, a former resident and miner in Shasta county, where these dams have been worked several years. Having seen different appliances for mining in various parts of the world, I determined to see this novel arrangement, and started up there on Friday last. On the way I noticed there were more men mining on the old river and its banks than any of the other streams around Downieville, for the Middle and East Forks are almost entirely deserted, even by Chinamen. I arrived and was welcomed by Jim Gilson and Mr. Moser. The dam had just emptied itself, and they were rolling away the big bowlders, loosening the gravel with their picks. It takes about two hours for the dam to fill, and then about that time to prepare for the cataract. Jim was enthusiastic, and said: "Be the powers, when she goes we have to sthand from under; be jabers she's a daisy—works while we are sleeping, an' makes things howl. She'll be off again in half an hour," and I waited to hear the howling. Presently there was a loud, rumbling roar, and "here she comes" from Jim. We could see the fine spray, like mist, rising, coming down the steep ravine, and the water leaping, bubbling and boiling in a white foam. It took down a log twelve feet long and two and one-half feet in diameter, and we could hear the big howlders, some more than a ton in weight, groaning and grinding beneath the furious water.

All traces of the loosened rocks in the channel for five or six feet wide were gone. In five minutes the water subsided, to be again repeated in two hours. Every particle of gravel and sand was washed from the bedrock on the line of the stream. The gold can easily be picked up, as the bottom is lava. When the dam was again near full, I went up to see the next operation, and observe how it worked. On top and at right angles with the dam is a beam or lever thirty-five feet long, resting on an iron pin at about one-third the length of the beam. The outlet from the dam is nine feet long and two feet deep—that is, eighteen feet of water—with ten feet of pressure suddenly let loose, and what we would call the gate is an apron, made of canvas, nailed on its upper edge to the beveled aperture. It does not rise like an ordinary gate, but partly rolls up, like a theater curtain, when that end of the beam rises. At the lower end of the beam is suspended a tub, with small holes in its bottom, and about sixteen feet from and near a level with the top of the dam, when the gate is down. From the lower edge of the top of the dam is a common sluice box, sixteen feet long, with a ten-inch high gate in it to hack the water ten inches over the surface of the dam.

This gate has a small lever, to the lower end of which is a wire connected with an oil can underneath the box. The oil can has holes in the bottom. When the water in the dam runs over the small gate, it fills the oil can; that brings down the small lever, and raises the gate in the sluice box, allowing ten inches of water to rush into the large tub; that fills instantly and brings down the large beam that is ballasted. The upper end raises the apron or canvas gate, then there is a rush and the roar of eighteen square feet of water with ten feet pressure. By the time the water has rushed out of the dam the water in the tub has run out of the small holes in its bottom, the weights at the end of the lever above the dam have brought that end down, the curtain is closed, and again the reservoir begins to fill; the water runs out of the oil can suspended below the sluice box, and the small gate comes down to its place; and thus it works, day and night, twelve times in twenty-four hours; and two men can do the labor of ten or twelve with more ease than the ordinary way of mining, and scarcely leave a particle of gold behind them. The old ravines that have been rich can by this process almost all again be made to pay handsomely. After the dam is once built it is the most attractive process of mining there is, and when it comes into general use, as it surely will, it will be the most popular. Thousands of ounces of gold will find their way into Downieville that would not be brought in by any other process at working the old, deserted ground. The miners can pay a visit and see the operation for themselves, and may then understand it better than any attempt at explanation. But it is, as Jim Gilson says, "Be my soul she's a power; works at night like a giant; by day she's a daisy, and makes things howl."

CALIFORNIA PETROLEUM.—A dispatch from Bradford, Pa., says: A well-known Pennsylvania oil operator, recently returned from the petroleum districts of the Pacific coast, gives a glowing account of the nature and profits of the operations there. He says the finding of oil in the California districts is as certain as it was in the Bradford field. The drill always finds deposits, and no failure—at least in three of the districts—has yet resulted. It costs $7,000 to put down a California oil well after the tools are on the ground, or twice as much as a Pennsylvania well; but after it is down and flowing or pumping, the California well is a much more valuable piece of property than the other.

Idaho Coal Fields.

The Wood River *Times* says: A. L. Rinearson, the well known surveyor, has come from Boise to look after some business matters. Mr. Rinearson brought with him a small quantity of the coal which was found in the Squaw creek country about a year ago, and which he has been busily engaged in developing ever since. With what he brought here he has had tests made at the blacksmith shops in town, and with the most satisfactory results, the coal being as good, in all respects, as any blacksmith need use.

Mr. Rinearson did not bring the coal here to advertise it for the purpose of creating a demand for it, as he has a good home market at $20 a ton for all that he can extract, and this without any trouble on his part. Dave Conghanour, superintendent of the Gold Hill mines, at Quartzburg, who has been paying $120 a ton for his coal until recently, has made a contract with Mr. Rinearson for his entire winter supply for all purposes.

The new coal fields cover an area of twelve miles square, or four townships, and crop out for the entire distance. But four persons have as yet become interested, to wit: Messrs. Miner, Rolfe, Stone and Rinearson; but it cannot be long before quite an industry will spring up there, and the coal fields be all taken up. The find under consideration is hardly thirty miles distant from the Oregon Short Line, and only twenty miles distant from Boise, the terminus of the connecting line.

The importance of this find to Wood River and to the great Northwest generally cannot be overestimated. It will secure to us a first-class fuel at the price of a second or third-rate article, and thus be of incalculable benefit in various ways. In the development of the smelting industry of Wood River this new coal will play an especially prominent part, as the coke produced from it will materially reduce the cost of smelting, and enable us to reduce at home large quantities of ore that would otherwise have to be left in place, or shipped and sold on a very small margin of profit.

The new coal will not be available for the Wood River market for a year or so; but by that time the mines will doubtless be sufficiently opened to insure a steady yield.

For awhile the coal will have to be brought to Hailey over the Oregon Short Line to Shoshone, thence over the Wood River branch. But in time a direct line of railway will doubtless be built from Wood River to the coal fields—a distance of only ninety-eight miles in an air line—and we will then have the coal brought here at minimum cost.

Raising Coal from Deep Shafts.

The question of raising coal in deep shafts is slowly but surely demanding more and more attention from the mining and mechanical engineer. Every year the area of unworked coal lying at shallow depths from the surface is becoming less, and the resources of England for supplying the current and increasing demand lie at increasingly greater depths; hence many new sinkings have been carried down much deeper than those of earlier date; and, looking forward beyond immediate wants, the total area of unworked and unproved coal in the United Kingdom is no doubt very large, but much of it will be found at depths greater than any as yet reached. Some writers have quoted 4,000 feet as the limit of accessible depth, beyond which the increase of temperature and other difficulties will prevent the mineral being worked. Other authorities have estimated it up to 7,000 feet. In the year 1866 a royal commission was appointed to investigate the quantity of available coal, and the report placed the maximum depth at 4,000 feet, a limit which has been adopted by many scientific gentlemen. The deepest mine in England is Rosebridge, 2,418 feet; that is, 806 yards deep. This has been at work for some years, yielding a fair quantity of coal. The deepest coal mine in the world is one near Charleroi, Belgium, namely, St Andre shaft, at the Poirier colliery, which is 2,724 feet; that is, 908 yards deep—830 meters. The coal is raised by an iron wire flat rope, seven inches broad, and composed of eight strands, its weight being 9 tons, 11 cwt.—9,700 kilograms. The Simon Lambert shaft, in Belgium, is 3,489 feet; that is, 1,163 yards deep; but this is only an exploration shaft, and not worked, being partly filled with water. At the St. Andre shaft the winding is slow, and the quantity of coal raised about 260 tons per day. There is another deep shaft near Charleroi, the Sacre Madame colliery, at Dampreney, which is 2,498 feet, that is 833 yards deep, where the coal is raised from bottom to top in fifty-seven seconds. This is about the same speed as that run at Rosebridge. It may be inferred from these facts that the depth of 4,000 feet is not too great an assumption of the ultimate limit of coal working; and considering the great area of unworked coal lying between the average or the greatest depth of the present shafts in England, and the contemplated depth of 4,000 feet, there is little necessity, at least for some time to come, of entering into any theoretical opinions or calculations to prove the possibility of raising coal, in one lift, from the greatest possible depth at which coal could be worked. It is probable that the limit of depth will not rest or be governed by the mechanical appliances used in raising the coal, but by temperature due to depth and the weight of the superincumbent strata.—*Coal Trade Journal.*

A New Kind of Quartz Mill at Grizzly.

Of late much attention has been attracted among miners at Grizzly to a new invention in the way of a quartz mill that is now being tested there. It is called the Dyer Cannon Ball mill, and those who have seen it work are confident that it will be a success. The mill is in the shape of an upright cylinder, the ore being thrown into the top where it is broken into small pieces, while below are some revolving iron balls that reduce the hardest quartz to a powder. With a very small expense self-feeding apparatus can be attached to the mill. Screens can be used the same as on an ordinary mill, and its appliances for saving gold are as perfect as those in any stamp mill can be. Heretofore all attempts at making a good cheap mill have proved failures. Men in the East who have little acquaintance with the nature of quartz and its reduction, have invented and sent out mills that would rattle to pieces and wear out with a few weeks' run. The inventors of the Cannon Ball mill are old miners who have had many years experience in the reduction of quartz in the northern part of the State. They put up one of their mills on the Eagle King mine near Grizzly about six weeks ago, with the agreement that if it did not work satisfactorily it was to be removed without any expense to the mining company. It was successful beyond the highest expectation of those who saw it operate. Miners came from every direction to see it, and all were very favorably impressed, despite the general prejudice there is against all others than stamp mills. The cost of one of these mills of the largest size is less than $500 when all ready to work. An ordinary ten-stamp mill costs from $5,000 to $6,000. Any kind of power can be applied to the Cannon Ball mill. With from two to three horse power it will reduce from six to eight tons of ore a day, which is almost as much as can be reduced in a ten-stamp mill. The machinery is simple, and the parts exposed to wear can be replaced as easily and cheaply as the shoes and dies in a stamp mill. Only one man is required to operate it. After the six weeks' run at the Eagle King mine, the mill was in as good condition as when first put up. It not only proved the mill to be a success, but also the mine. The visiting miners were delighted with the sight of the amalgam that kept piling up on the plates. It only took a few days' run to pay the price of the mill. This is a good mine, and will, no doubt, be booming as soon as Mr. Camp, the superintendent, who has been very sick, recovers his health sufficiently to attend to it. Other Cannon Ball mills will soon be put on other mines around Grizzly. The owners offer very liberal terms to any poor miner who has got a ledge. They offer to put up a mill for any one who will get out fifty tons of $10 ore. They will reduce the ore and take their pay from the proceeds. This will enable any poor man who has a small ledge to get a mill of his own. Heretofore poor men have not been able to work mines because of the great cost of erecting mills, and the expense of hauling the ore for miles to a mill soon eats up all the profits. Many a mine has proved a failure because the owners spent all their money in building a mill, and then were not able to open the mine. Our county is full of small ledges that would pay to work, and if the Cannon Ball mill continues to work as successfully as it has in the past, hundreds of miners will soon find independent and profitable employment. The introduction of this mill may mark a new era in quartz mining, and not only prove a great benefit to its owners, but also to the county.—*Placerville Democrat.*

Pioneers of the Comstock.

The Reno *Gazette* says: The first locators of the Comstock lode seem to have but little interest in it now, and they are scattered far and near. Alva Gould, who staked the party of prospectors that discovered silver in Gold Hill in 1859, lives in Reno and runs a fruit wagon around through the ranches in the valley. Abe C. Curry is dead. A. G. White, of the Murphy and White, is in the sheep business. He lived some years at Tecoma, Nevada, but moved north last year. John Murphy made a raise and died in San Francisco. R. D. Sides is at work on Theodore Winters' ranch in Washoe valley. John D. Winters is in California. He was in Reno a couple of weeks ago. Jos. Kirby is in Virginia City. Henry B. Comstock suicided in Boise City in 1868. Emanuel Penrod is in Elko county mining. Pete Riley and Pat McLaughlin are dead. John Bishop has been in Reno inside of a month. He is not rich. H. B. Camp is in New Mexico. James Corey is working a mine on American Flat. Joseph Webb is dead. E. Belcher is in the cattle business in Evanston, Wyoming. Abernethy is at Suisun and Baldwin is at Napa on a farm. Casteli froze to death at Meadow Lake. J. C. Osburn is dead and Joseph Rogers shot himself in Virginia. Sandy Bowers is buried on the hillside back of the Bowers mansion in Washoe valley, and his wife is telling fortunes. Len C. Savage has been dead some years and his wife is a respected citizen of Reno. Norcross is foreman of a planing mill in San Francisco. James Finney, "Old Virginny," is dead. Not one of the old boys has a cent's interest in the Comstock, and few of them much property of any kind.

THERE is no truth in the report that the steamship *Wellington* will bring a cargo of coolies for the Wellington mines.

Oregon Copper.

The Walla Walla *Union* says: "About a year ago a vein of copper ore was struck in Baker county, Or., and has since been partially developed by a Walla Walla company, organized by H. E. Holmes, A. Reeves Ayers, T. J. Anders, J. M. Boyd, A. B. Weed and Frank D. Boyer. Recently, Dr. Boyd went over to Seattle, and the *Post-Intelligencer* of that place is moved to relate as follows: 'It will be remembered that about twelve months ago copper was discovered in vast quantities in Baker county, Or., and that M. V. B. Stacy, John Leary and E. S. McComas became the owners of three claims on the principal lode. A company in Walla Walla, represented by H. E. Holmes and others, also became the proprietors of the three adjoining claims. Considerable sums of money were expended last year in prospecting by both companies, and the ore was brought prominently before San Francisco and Eastern capitalists, who, having it assayed, pronounced it equal in richness to anything yet discovered. The attention of the Lake Superior copper company was called to it, whereupon Captain Hoatsen, superintendent of the Lake Superior Calumet mining company, was sent out to examine and report upon the mines. The result was a consolidation of the Walla Walla company and the Seattle company, Captain Hoatsen agreeing to immediately commence the development of the mines. The captain, who is at present in Seattle, reports that two chimneys of copper in sight are of immense value, providing the vein runs true and are unbroken, which can be fully demonstrated upon an outlay of about $5,000. The Lake Superior company takes one-fifth of the consolidated mines, paying $100,000 therefor, conditioned upon the lodes proving as good as they appear on the surface. M. S. Booth, in the interest of the Copper King company, is now at the mines, and yesterday he was wired to return to Walla Walla and meet Captain Hoatsen and the gentlemen connected with the Walla Walla company, sign articles as trustee of the consolidated company, and turn over the personal property of the Seattle company to the consolidated company. The trustees of the consolidated company are principally citizens of Walla Walla and Seattle, John Leary and S. M. Booth representing the Seattle interests as trustees. Captain Hoatsen, who visited these mines, states that if they turn out one-tenth as rich as the veins now exposed would indicate, the consolidated mine is worth millions of dollars.'"

Washington Territory Iron.

Fifteen years ago Hon. Arthur A. Denny discovered a valuable ledge of iron ore up near the Snoqualmie pass, on the west side of the mountains. Subsequently Messrs. A. A. Denny, A. Mackintosh, Jerry Borst, and S. H. Taylor became interested together, and took claims. They now hold 13,000 feet of iron territory. Until very recently nothing has been done toward developing these valuable deposits of mineral. A short time ago the gentlemen above named placed funds in the hands of C. K. Jenner, Esq., for the purpose of developing their property. He now has a force of thirty men engaged in clearing a road up to the mine, erecting cabins and carrying in supplies. This force will be worked during the entire season on the property. The quantity of iron ore owned by these gentlemen is practically inexhaustible. There is absolutely no end to it. Mr. Denny informs the *Chronicle* that he has obtained assays from competent parties which shows a per cent of from 80 to 87 iron. This is remarkably pure and the iron is of the most excellent character, equal to the best produced in the United States at this time.

The railroad surveys for a line over the mountains via Snoqualmie pass cross these ledges. They are from the present line adopted by the Northern Pacific via. Stampede pass, not to exceed nine miles distant at the nearest point. There is not the slightest doubt that a railroad will be run to the mines within a comparatively short time, and that its product will be made into articles of commerce at this place. This mine is one of the many sources of latent wealth which seem to literally hedge this city about.—*Seattle Chronicle.*

THE Smoke Abatement Institution is a London notion. It was recently stated, at a meeting of the same, by the Duke of Westminster, that it was an admitted fact that a sum amounting to no less than £1,000,000 was annually lost in London alone in the shape of unconsumed fuel, which escaped in the form of smoke, and that damage was caused to property to the amount of fully £2,000,000. Here is a fortune for a Yankee inventor.

OIL IN COLORADO.—A Denver dispatch says: For three years or more capitalists here have prospected for coal oil in the vicinity of Canyon city, in this State, but with indefinite results until Wednesday night, when a vein was struck in the Land Investment Company's well, which has since yielded at the rate of 40 barrels per day, and of excellent quality, demonstrating to a certainty that oil exists in paying quantities in that vicinity.

ARRIVALS from Quatsom, B. C., report that the West Vancouver coal company of San Francisco have struck a fine seam of bituminous coal in their claim.

The Engineer.

Aerial Navigation.

Inventors seem determined to make aerial navigation a practical success. The latest important effort in that direction is referred to as follows by the *Scientific American*:

A certificate of incorporation has been filed in the office of the Secretary of the State of Illinois for the "Aerial Navigation Company of Chicago," the object of the incorporators being "the transportation of passengers and freight through the air." It is asserted that the machines to be manufactured by this company are a perfection of the one tested at Hartford, Conn., several years ago, which at the time attracted considerable interest. Probably this refers to several trials of a balloon made by Mr. E. F. Ritchel, of Bridgeport, Conn., who exhibited in Hartford, in June, 1878, a balloon with propelling apparatus attached by which the upward and downward movements of the balloon could be governed, and by which in calm weather its course could be directed.

The balloon was a horizontal cylinder of silk, twelve feet long and twenty four inches diameter, capable of containing 3,000 feet of gas. Suspended to it by cords and steel rods was a flat frame of brass pipe, pointed at each end, and having a seat for the operator. In front of the seat was a gear wheel with two cranks, connected by a vertical shaft and a horizontal shaft of two peculiar wheels, one at the lower end of the vertical shaft under the frame, and the other in front of the operator, and this wheel was attached to the shaft by a universal joint so that it could be turned a distance of about thirty degrees from the shaft in a horizontal plane by the feet of the aeronaut. This wheel was the propelling power and also the steering device. The levitating power of the balloon was barely sufficient to raise the apparatus and its load, the vertical propeller assisting if a rapid rise was desired, and bringing the balloon down without emitting any gas.

At one trial, on a calm day, the balloon rose from the baseball grounds at Colt's Meadows, Hartford, passed over Colt's factory, and nearly over the Connecticut river, turned about and returned, descending to the ground at the place from which it started, the distance being probably half a mile and return, the balloon's height after rising from the earth varying from three hundred to four hundred feet, or thereabout.

At another trial, on the succeeding day, with quite a stiff breeze blowing, the aeronaut was unable to turn his balloon around, or to stem the wind, and was forced a distance of nearly nine miles, when he descended and came back, with his balloon, by carriage. But on this occasion he descended once on his trip to the dooryard of a farmer, procured a glass of water from the well, and rose again, hoping to make a return trip.

No accurate test was ever made of the propelling or lifting power of the two fans, but they were sufficient, as proved by repeated experiments, to raise, lower, and steer the balloon except in a strong wind, the operator rotating the cranks at the rate of one hundred revolutions per minute, producing, by means of pinions, a revolution of the fans of 3,500 turns per minute.

A Gigantic Dock Enterprise.

So great has become the demand for water front in London that the East and West India docks company of that city has boldly embarked upon an enterprise for obtaining the necessary room by improving the river Thames at a point many miles below the city. In fact, it implies the formation of an entirely new entrepot for the heavy shipping business of that great mart. The plan is nothing more nor less than the construction of docks at Tilbury, on the Thames, opposite Gravesend, of such magnitude that the *Globe* says: "On the whole, this dock extension promises to be the most remarkable that even London has ever witnessed, and will leave all other ports in the world far behind." They will have a tidal basin with a depth of forty-three feet, and the largest vessels afloat will go in and out without regard to the tide. The contracts call for four dry docks, with a total length of 1,730 feet, a floating derrick with a lifting capacity of 100 tons, special wharves and abattoirs for the cattle traffic, 15,000 lineal feet of quay berths, from forty to fifty miles of permanent railroad tracks, and a large hotel for the accommodation of passengers. "Tilbury is certainly at a considerable distance from London," says the *Globe*, "but with the railway facilities to be organized a few miles more or less will really be a matter of no great importance, while it is undeniable that, with the huge ships of the present day—and they still seem to be continually advancing in dimensions—the avoidance of a few miles of river navigation, with its windings and shallows and fogs, and the necessary cost of tonnage and pilotage, must be an immense advantage." The contracts call for the completion of the work within two years and a half, of which one year has already elapsed.

Over the Ocean on Wheels.—A dispatch from London, dated July 29th, says that Terry, the man who left Dover at 9 o'clock yesterday morning on a floating tricycle, crossed the English channel, and arrived safely at Calais at 5 o'clock in the afternoon.

Useful Information.

Horseshoes.

Horses were not shod in Egypt, Assyria or Palestine. The latter country was supplied with horses by the Egyptians. Solomon paid 150 shekels of silver, equal in value to $75, for each horse. This was a high price, the difference in relative value of a shekel and a given weight of wheat being considered. Isaiah speaks of horses whose "hoofs shall be counted like flint"—a valuable quality where they were shoeless. The Syrians and Hittites were supplied with Egyptian horses by Solomon, who thus turned an honest penny by this means.

Aristotle and Pliny mention the covering of horses' feet in stony places to protect the hoof from breakage and wear, but it is probable that such a covering was a bandage or boot, and used principally on long journeys. Suetonius refers to the dismounting of Vespasian's muleteer to shoe his mules. Wrappings of plaited fiber, such as hemp or broom, were used, as was also leather. In Japan the horses have clogs of twisted straw, of which a large supply is carried on a journey; when worn another is immediately applied. The American custom of shoeing would no doubt appear a barbarous custom in their minds. Captain Cook refers to the fact that the Siberians and Kamtschatkaus use traveling socks for their dogs.

Camels in old times were similarly provided. These boots were drawn on over the feet, and it does not appear that iron or other metallic plates were nailed to the hoofs. Such boots were shod with metal for the rich. The mules of Nero were shod with silver; those of his wife, Pappea, with gold. For less stately purposes mules were shod with iron. Homer mentions brazen-footed steeds, probably a merely metaphorical expression implying strength. Mithridates and Alexander experienced great difficulty with their cavalry, owing to the soreness of the unprotected feet of the horses in long marches. The first certain mention of shoes being nailed to horses' hoofs is in the works of Emperor Leo, ninth century. The practice of shoeing horses is said to have been introduced into England by William I.

In two respects the shoeing of horses in Holland differs from ours. First, to prevent slipping, the forehoofs are pared away to the toe, and the shoe so fitted that the toes do not touch the ground when the foot stands flat, the weight resting on the middle and heel of the shoe. Second, the shoe is nailed on perfectly flat and close to the foot, which is flattened to receive it—the iron is thereby deprived of all spring, and the hold of the nails is undisturbed. The frog comes in contact with the ground.—*Blacksmith and Wheelwright.*

Asphalt as Fuel.—The large amount of asphalt found in this State and many other portions of the globe furnishes inventors a good field for the study of some effectual means to utilize it as fuel. It is said that many of what were at first thought to be coal mines, especially in Mexico, are really deposits of bitumen. Now, while asphalt is highly combustible, there seems to be at present no practicable method hitherto suggested to utilize it as fuel, owing to its ready melting when subjected to heat. It is likely, however, that with the demand for cheap fuel now felt, especially in California, and in those sections near which our principal asphalt beds are found, some effective method might be devised to make practical use of its heat producing qualities; burning it, perhaps, after reducing it either to a liquid or vaporized form. The inventor of such a process could command a handsome fortune for the use of the right in this country. The products of the new oil wells in Vera Cruz, much of which are said to be too heavy for illuminating purposes, might also be utilized in the same manner.

Oily Substances in Rice.—According to G. Campari ("Annals of the Milan Society of Applied Chemistry"), oily substances are contained in large quantities in the embryo of the rice, which he finds to be composed of 95.54 per cent of fatty acids, and 4.46 per cent of glycerine. Treatment with bisulphide of carbon produces a yellow wax-like substance which readily saponifies with bases, melts at 32° C., becoming quite solid at 28° C., with a specific gravity of 0.93005. It is completely soluble in ether, chloroform, and benzine; its composition appears to be C 79.2, H 10.9, O 9.9, per cent. The fatty acids melt at 36° C., emit a perceptible pear-like odor, and yield, when saponified and heated with magnesium acetate, a body which melts at 62° C., and exhibits the composition of palmitic acid—$C_{16}H_{32}O_2$.

Cherry Wood Again in Demand.—Those to whom fifty years is a memory readily recall the cherrywood tables, bureaus, drawer chests that were then in fashion, when the more gaudy and more costly mahogany had but lately come in. It is an evidence of a return to good taste that the wood of the cherry tree is again in favor, not only as it exists in old furniture, but in its new requirements. It is largely used in cases for musical instruments—melodeons and organs—and in furniture—chairs and tables—after being "ebonized," or blackened by acids and dyes. But it is also coming again into use in its natural color. One of the finest banking houses in the Eastern States is finished entirely in cherry, and it is beautiful. The wood, filled and not varnished, has a soft glow not possessed by any other, and has none of those distortions of grain that are so unpleasant in mahogany. The timber is chosen from the wild cherry, which in New England and the North generally does not usually grow to a girth of more than 20 inches, but in some of the Western States and in the South frequently attains a diameter of 24 inches. The domestic fruit cherry gives some good specimens of small timber, but as the tree is rarely sacrificed until it is past bearing and is decayed, this source of supply is precarious. Like all close-grained timber, the best specimens are those which grow singly in exposed situations and not in a dense forest. The facility with which cherry can be worked makes it a favorite with the cabinet-maker. *Ex.*

Postal Notes.—It is only a month before the public will have the new postal notes, the limit of their preparation being September third. They will prove to be a great convenience, as the sender can transmit any sum from one cent to five dollars. The New York *Tribune* illustrates the convenience of the new arrangement by stating that "a lady living out of town who wants to send $3.79 to a dry goods store in New York, will hand that sum, and three cents fee, to the postmaster. He will give her an order with the figure three punched in the dollar column, the figure seven in the column of dimes, and the figure nine in the column of cents. This is simple and easy, and offers no chance for fraud."

Scientific Buffoonery.—Some scientists seem to delight in doing what is calculated to shock the sensibilities of the unlearned, even going so far in some cases that their own sensibilities must be pretty well tested. For example, M. Paul Bert not long ago entertained a party of friends with crocodile steaks, and Dr. Hermes, director of the aquarium at Berlin, feasted his confreres on the eggs of a snake, a huge python recently received from India. How much better for humanity would it be if these men of science, whose fame and influence are world-wide, would set an example of sobriety, and exhibit some experiments illustrating the advantages of simplicity of diet, instead of seeking to startle the world by such repulsive exhibitions! —*Herald of Health.*

Gold Waste in Jewelers' Shops.—A pine floor laid in a gold-worker's shop in ten years becomes worth $150 per foot. A Syracuse jeweler once bought for less than $50 some sweepings that gave $208 worth of gold. A tub in his cellar, into which is blown the dust of a polishing lathe, accumulates $50 a year. A workman in his shop carried off on the tip of his moistened fingers $30 of filings in a few weeks. Workmen sometimes oil their hair, and then run their fingers through it, leaving a deposit of gold particles, which they afterward wash out.

Good Health.

Importance of Ventilation.

One of the great evils arising from the aggregation of large numbers of people, as in cities, is the vitiation of the air in the halls, rooms, closets and cellars of our dwellings. Thousands of people are carried off annually from the entrance of such gases into our houses, and its unnecessary retention there in consequence of imperfect ventilation.

Of course no gas will rise from the sewer into our homes except it be enough lighter than air to force its way up, and often through the best constructed traps. It rises to the highest part of our halls and rooms, above the windows even, if open. By contact with air—it may in some cases be warmer or colder, moister or drier—a heavy resultant is precipitated to the bottom of our rooms. If our rooms are not ventilated at the bottom, the accumulating heavy gases, the most deadly of all, gradually fill the space upward until it reaches the height of our beds, the heads of our little ones, and finally the nostrils of adults, before it reaches an opening in the wall; while if there was a ventilator near the floor, or an opening under the door, it would flow off without rising under the same law as water flows, and without injury to the human system.

True Principles of Ventilation.

Let no one rest in a room closed at the bottom, no matter how open at the top, and consider the place well ventilated. The breath that leaves our bodies, like the light sewer gas, rises upward, and in contact with cool air, falls in part as a heavy gas to the floor, and will finally contaminate the air up to the point of ventilation before it can flow off, under the same law that a tumbler holds all the water poured into it until the fluid reaches the top. Another point, your breath rises above you in a room, and no fresh air from without can reach your nostrils from an opening above without passing through and mixing with air already contaminated with your exhalations.

Now, if an opening is made below the hight of the head, whether we are reclining or standing, the coolest air always entering at the lowest point will supply our nostrils with the purest atmosphere.

If no opening is made at the top, of course our exhalations, lighter than air, rise above us, and no matter how open our room may be at the bottom, they are held in the same manner that light gases are held in an inverted vessel.

If there is an opening at the top as well for all impure air to pass off before becoming cool and heavy, the fresh air coming in below the point of breathing will be as fresh and pure as that outside. In a cold or windy climate, those who are delicate should carefully experiment as to the amount of opening which is best for themselves at both top and bottom, always remembering, however, that the nearer the extreme top the upper openings are made, the more perfect will be the ventilation. In some cases it will be well to commence with moderate ventilation and increase gradually as one becomes accustomed to it until the most desirable amount is reached, which may be different, according to conditions, with different persons.

Those who have children or invalids in their care, who need older and stronger minds to act for them, should not pass the matter of ventilation lightly by as of little importance, because in their own strength, or other fortunate circumstances, they have hitherto prospered without giving it thought or attention.

Those who are growing old and feeble may add much to their strength, comfort and length of days by careful and well-regulated ventilation.

Keepers of hotels, and health resorts especially, may add much to their profit by so arranging the ventilation of their rooms that guests will rest themselves into good humor and health, to the liking of the establishment, and the praise of the climate and everything pertaining to the comfort and health of the place.

There are many landlords and landladies in California, who, through both ignorance and indifference, are killing scores of inmates, simply by not conveniently providing the means of ventilating their rooms at both the top and bottom, when only one "almighty dollar" would pay for the entire alteration necessary for good ventilation. They are not only slowly and surely destroying their patrons, but making victims for doctors who do not believe in ventilation.

Oakland, August, 1883.

Poisonous Honey.—Few people know that in bad seasons honey is apt to be poisonous. This arises from the fact that in such seasons the bees are obliged to gather it from poisonous flowers. Great care should be taken to remove all poisonous plants from the neighborhood of the hives. A specimen of honey from Trebizond, gathered from the *rhododendron ponticum*, which is common in that neighborhood, was sent in 1834, by Mr. Keith E. Abbott, to the Zoological Society in London, and in 1859 it still retained its poisonous qualities. In 1796 a great many people in Philadelphia died from eating honey gathered from the flowers of the *kalmia latifolia*. In good seasons the bees avoid poisonous herbs.

Neuralgia as a "Warning."—One of the London medical journals declares that the great prevalence of neuralgia—or what commonly goes by that name—should be regarded as a warning indicative of a low condition of health, which must necessarily render its subjects peculiarly susceptible to the invasion of diseases of an aggressive type. It is always essential that the vital forces should be vigorous, and the nerve-power in especial in full development; but neuralgia indicates a low, depressed state of vitality—a poor and weak state—and should be promptly placed under treatment.

Barley.—Barley is a very nutritious article of food and easily digested. The American grain is richer in starch than the European. Some samples contain as much as 69 parts of starch in 100, with 45 parts of albuminoids, 3 to 4 parts of mineral matter, and over one part of phosphoric acid. Ground into a fine flour and mixed with one-third its weight of equally fine oatmeal flour to improve the taste, and we have an article for gruels for the sick excelled by nothing else, and far superior in every respect to beef tea.

Noises in the Ear.—The most unpleasant accompaniment of disease of the ear is sometimes so distressing that the patient is rendered almost frantic. Indeed, cases of insanity have been traced to this cause alone. Some cases may be relieved by simple inflation of the ear, which may be done by grasping the nose with the thumb and forefinger in such a way as to close it completely, closing the mouth, and then making an effort to expel the air through the nose. This should not be repeated oftener than two or three times a week.

Hot Water Bottles.—For many purposes dry heat is better than moist, as for warming the feet or hands, and in many cases of neuralgia. Water cools more slowly than most solid substances, and hence a bottle filled with water will retain its heat a long time. The water may be made to retain its heat still longer by adding salt. A still better fluid is a solution of acetate of soda, which may be made by dissolving ordinary baking soda in strong vinegar as long as effervescence continues.

Granulated Eyelids.—We have found the hot spray applied to the eye one of the most useful of all means of treating this disease. If a spray apparatus is not at hand, simply laving the eye with water as hot as can be borne without inconvenience may be employed. The application should be made daily for several months, as this disease is one which requires months, and in some cases years, for its successful treatment.

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SAN FRANCISCO:

Saturday Morning, Aug. 25, 1883.

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Passing Events.

The city is in holiday attire, and business is carried on just at present only in a feeble way, as so much attention is paid to the processions, receptions, and various festivities of the visiting Knights Templar. It would take more space than our columns afford simply to enumerate the various occurrences in this connection. Suffice it to say California's noted hospitality is recognized and appreciated, and all that can be done has been and is being done for the entertainment of our visitors.

News from the mines is uninteresting as far as special events are concerned, except the news of the important find of ore at the greatest depth in Eureka district, Nevada. At the new Locan shaft on the Eureka Con., which cost, with its machinery, $700,000 and three years' work, now at a depth of 166 feet below the lowest workings on the old mine, $40 ore has been struck, and splendid results are anticipated. This is a highly important strike for the "Base Range."

A complete copper furnace plant of the character described in another column of this week's PRESS has been furnished to the Southwestern reduction works, Ivanhoe, N. M., John Magruder, manager; Cochise Copper Co., Peabody, Arizona, F. F. Thomas manager. There are also two furnaces forty two inches in diameter in operation at the San Pedro mine, N. M.

IN our foundry notes last week we inadvertantly spoke of the improved Cranston hydraulic elevator as being in use at Cherokee, Butte Co., instead of at Yreka, Siskiyou Co., where there is a fine one giving satisfaction.

THE settlement along Wood River exteuds to fifteen miles below Hailey, where the river passes through a canyon in the table lands some five miles before reaching another valley.

Sulphur.

Its Occurrence and Production on the Pacific Coast.

Deposits of sulphur abound in many parts of the Pacific States and Territories; the mineral being, in some instances, abundant and quite pure, and in others quite the reverse. The most extensive and valuable deposits of sulphur yet found in this region of country is that of Rabbit Hole Springs, Humboldt county, Nevada, though the first discovered and worked is situated near Clear Lake, in California, where a refinery having a capacity of six tons per day was erected and commenced operations in 1864.

The sulphur here occurs in a decomposed extensively fissured volcanic rock. Through the orifices, steam and sulphurious vapors issuing, deposit the mineral near the cooler surface, where it is found intermixed with earth, silica, foreign matter in proportions varying from 10 to 35 per cent. Solfataric action is still going on in the neighborhood, the water in some of the springs bubbling with intense heat and noxious gases issuing abundantly from the fissured rocks.

A curious feature of this deposit consists in the occurrence of cinnabar, a notable percentage of which is found associated with the sulphur. The crude material here having been shoveled into wheelbarrows, was carried out and thrown into a furnace and there heated. Passing from this furnace into a receiver and then into large iron kettles where it was purified, the liquid mineral flowed into wooden molds, in which it became solidified and was then ready for market.

In five or six years the quantity of sulphur turned out here amounts to several hundred tons annually. Though an article highly acceptable to the trade was produced, the proprietors of these works were finally obliged to suspend operations, owing to the low prices at which foreign sulphur could be laid down in San Francisco.

Two miles from the locality above described, on an elevation known as "Chalk Mountain," occurs another deposit of sulphur of large superficial dimension, though nothing is known as to its depth. The rocks here, also extremely fissured, have been much decomposed by the action of steam and acid vapors, giving them a chalky appearence. Nothing has ever been done with this deposit.

Sulphur at Rabbit Hole Springs.

The more valuable portion of these beds belong to the Humboldt Sulphur Co. They are about thirty miles northwest of Humboldt station on the C. P. R. R. Though not yet much explored, these beds are known to be very extensive, several large bodies of high-grade mineral having been opened up, and surface indications of a promising nature being met with over an area of several hundred acres. At several points bodies of nearly pure mineral 200 feet long, from thirty to forty feet wide, and of unknown depth have been developed.

The sulphur here occurs in strata reposing under a thin layer of ashy-like earth, which, being scraped away, exposes in many places great masses of brimstone, so solid that some force is required to break it out. Large pieces are sometimes quarried here. A block weighing 1,200 pounds was taken out and started for the Centennial expositiou, but in reaching the railroad was broken in pieces while being hoisted into a car.

In 1865, this company put up works on the ground for beneficiating the crude material, having previously shipped considerable quantities of selected mineral to San Francisco. At these works, which have a daily capacity of twenty tons, steam is employed for melting and refining purposes. The output of these works since being started has averaged about 1,200 tons per year, though much more could have been made had inducements offered. The company employs twenty men, all white, at three dollars per day and found, their operations continuing the year round without intermission.

While most of the sulphur made here has found a market in San Francisco, some has been disposed of to the reduction works and acid factories in Nevada. The Humboldt company have expended on their property between $60,000 and $70,000. The deposits of this company being situated in a barren and timberless country thirty miles from the railroad, the cost of these improvements, as well as current expenditures, has been large. They have been obliged to import nearly everything, fuel included, at heavy expense. Wagon transportation across the desert proving a burdensome item, the company, hoping to lighten the same, had recourse several years since to a steam wagon for performing the service. The experiment, which was attended with a heavy outlay, was a failure.

Notwithstanding the cost of producing sulphur at the above locality is so very considerable, this article could still be made there at a profit were the manufacturers all to keep the entire home market. This company could afford to supply the entire wants of this coast at the average rates that have obtained for the past two years, say $40 per ton, could such prices he assured them. As soon, however, as prices so appreciate that the home producer begins to ship freely, the foreign importer offers his stock at figures ruinous to the former, driving him out of the market, or forcing him to sell at a loss. With his rival out of the field, or so crippled that he is no longer formidable, the importer advances prices to the old standard. But, despite these sharp practices, sulphur on the Pacific coast, like borax, salt and some other commodities, has been greatly cheapened through importers having been forced to compete with the home producer.

In Various Other Localities

Throughout the extreme West sulphur has been met with in such quantity as to attract notice, and sometimes lead to attempts being made towards utilizing the same. Ten miles north of Humboldt salt marsh, in Churchill county, Nev., is a sulphur-bearing bed covering some thirty acres. Some of the mineral here is solid and quite pure, though the most of that on the surface is mixed with a large percentage of earth and other impurities. Holes sunk to the depth of a few feet at different points on this tract indicate large deposits below. With such slight prospecting, however, nothing positive can be affirmed in regard to either their extent or fertility. In the center of this tract occurs a crater-like depression, whence a strong odor of sulphur is emitted. As the locality is far from the railroads, difficult of access, and the country around exceedingly barren, and but little inhabited, this deposit is likely to remain for a long time neglected.

One mile and a half to the westward of that remarkable group of thermals known as Steamboat springs, in Washoe county, Nevada, occurs a sulphur-containing belt composed of a light colored formation resembling chalk or steatite and underlaid by magnesian limestone, traversed by small veins of iron and other minerals. Imbedded in this formation are numerous small strata of sulphur, some of it quite pure, though the major portion is largely mixed with impurities.

A good deal of labor has been expended here without remunerative results, the method of exploiting these deposits having been by shafts and open cuts, through which the sulphur was removed. Though located within a mile and a half of the Virginia and Truckee railroad, and otherwise favorably situated, no work has been done in these mines for several years past, the cost of collecting the crude material having been too great and its grade too low to warrant a continuance of operation.

Near the Fish Lake Valley marsh, Esmeralda, in the same State, is a bed of sulphur, apparently of considerable extent; but as it has never been worked, or even carefully examined, little more is known about it than the mere fact of its existence. Between Coso and Little Owens lake, in Inyo county, Cal., is a group of springs having the form of miniature mud volcanoes, about which occur deposits of sulphur, some of the surface exposure being quite pure. How much of the mineral there is below, or what may be its quality, has not been ascertained, but little work having ever been done here. In the foothills of the Coast range, at a point about thirty miles westerly from the town of Colusa, are sulphur beds of moderate extent and richness. A refinery was put up here in the early history of this industry, but the enterprise, for reasons already mentioned, came to an end after a short and profitless career. There are deposits of this mineral in the Azuere mountains, Ventura county, but their value remains undetermined.

Consumption of Sulphur on the Coast.

The consumption of sulphur here, like that of salt, is comparatively large, having amounted for the past ten or twelve years to as much as 3,500 tons per annum. Most of this is consumed by acid factories. A good deal is used on the vines in California, some by the powder works, there being also the usual requirements of druggists and manufacturers and miscellaneous consumers to be met.

The two principal acid works in California—the Judson acid works and the Golden City—use up annually in the manufacture of sulphuric acid about 1,000 tons of sulphur each; the three smaller acid works in California and one in Nevada use up perhaps one-fourth as much. With the exception of about 1,000 tons produced by the Humboldt company, the supply of this substance is obtained from Sicily, with an occasional cargo from Japan. Before any sulphur was produced on the Pacific coast the price of the refined article was maintained at about $50 per ton. Since sulphur begun to be manufactured here the price has seldom exceeded $40, and has much of the time been as low as $35 per ton. But for importations from abroad enough of this commodity to satisfy all demands could be produced at home. The duty on flour of sulphur amounts to $20 per ton with 15 per cent ad valorem added; on refined sulphur $10 per ton, the crude article being admitted free. Of this tariff the domestic manufacturers would make no complaint, but they say that large quantities of the refined articles are brought into the country under the name of crude sulphurs, thereby defrauding the Government of its dues, and the manufacturer of the protection he needs.

The cost of transportation from the deposits of the Humboldt company from San Francisco amounts to over $20 per ton. It reduces the profit or the product of their works to a narrow margin. As English ships coming to San Francisco to load with wheat bring the Sicily sulphur at very low rates, the market is always kept well supplied from that quarter. Some ten years ago small importations began to be made from Japan which it was then thought might become a prolific and reliable source of supply. Such, however, it has not turned out to be, shipments thence having been estimated on quantity, and arriving at such long and uncertain intervals as have precluded buyers from depending upon them.

LEAKY TUBES.—The proper way to plug up a leaky tube in a marine boiler is thus described by Edwards in the "Catechism of the Marine Engine:" Suppose the tube is 3 inches in diameter and 7 feet long. You take two white pine plugs 3 inches in diameter, tapering off to 2⅞ inches, and about 4 inches long. Next, bore a three-fourths inch hole through the center of the plug. Take a five-eighths inch bar, 7 feet, 4 inches long, with a thread cut 2 inches in length on each end. Run the bar through the tube, put in the pine plugs, and drive them in flush with the tube. Place a saucer-shaped washer filled with red lead, putty, or boiler-maker's cement, on each plug, and screw up tight with nuts. Iron plugs are sometimes used instead of wooden ones, but they are inferior to dry white pine plugs, for the reason that when the pine plugs become saturated with the hot water, which they do in a short time after insertion, they swell, and make a perfectly tight joint, whereas iron does not.

MINT DIRECTOR BURCHARD gives the product in precious metals of Silver Bow county, Montana, for the calendar year 1882, at $3,740,000, and for the Territory at $6,620,000. This is a very satisfactory gain upon the preceding year's product, which was given: Gold, $2,330,000; silver, $2,630,000; base metals, $1,090,000; total, $6,050,000. These figures bear testimony to the steady advance being made in the mining industry of the Territory, and prove that Silver Bow is the banner county of the Territory.

THE Silver Belt mine, Big Bug district, Arizona, is still in bonanza. From 30 to 35 men are employed in and around the mine. An average of 120 tons a month is being shipped to Pueblo, Colorado, for treatment. Ore goes via the A. P. railroad. The rock is rich, easy to work and should be treated at home.

THE ten-ton shipment of silver nuggets and rich ore from the Pine Spring mine ought to open the eyes of San Franciscans. It will be in the city in about twelve days, and we respectfully ask the doubting Thomases to examine the lot.—*Prescott Courier.*

A PARTY of engineers are engaged in surveying and prospecting for a route through Kern county for a narrow-gauge railroad, proposed to be built with a double track from San Francisco to Boston, by the People's narrow-gauge railroad company.

Specimens of sulphur are shown in the California State Mining Bureau from the following places in Nevada: Steamboat springs, Washoe Co., Smoky valley and Humboldt.

Blasting in Mines—No. 5.

Conditions of Disruption—Continued.

To show how these principles are applied in practice, we will take a typical case of a heading, seven feet by nine feet, as shown in Fig. 1. In this case we have at starting only one exposed face, which is perpendicular to the direction of the driving. Hence it is evident that we shall have to proceed by angling the holes. We might begin in any part of the exposed face; but, as it will hereafter appear, the most favorable position is the center. We therefore begin at this point by boring the series of holes numbered 1 on the drawings. These holes are angled towards each other; that is, the two sets of three holes vertically above each other converge in the direction of their lower ends, as shown in the sectional plan (Fig. 2). In this instance we have assumed six holes as necessary and sufficient. But it is obvious that the number of holes, as well as their distance apart horizontally, will be determined by their depth, the tenacity of the rock, and the strength of the explosive used. When these holes are fired, a wedge-shaped portion of the rock will be forced out, and this result will be more effectually and certainly obtained if the charges be fixed simultaneously. The removal of this portion of the rock is called "taking out the key." The effect of removing this key is to leave the surrounding rock unsupported on the side towards the center; that is, another exposed face is formed at right angles, or nearly at right angles, to the first.

Having thus unkeyed the rock by the removal of this portion from the center, it will evidently be unnecessary, except for convenience, to angle any more of the shot-holes. The second series, therefore (numbered 2 on the drawings), may be bored perpendicularly to the face of the heading. When this series is fired, the lines of rupture will all run to the unsupported face in the center, and from hole to hole, if the shots be fired simultaneously, and the annular portion of rock included between the dotted lines 1 and 2 will be removed. If the shots be fired successively, the first will act under the condition of one unsupported face; but as another unsupported face will be formed by the removal of the rock in front of this charge, the succeeding shots will be subject to more favorable condition. The firing of this second series of shots still leaves the surrounding rock unsupported towards the center, and consequently the same conditions will exist for the third series (numbered 3 on the drawings), the firing of which series will complete the excavation.

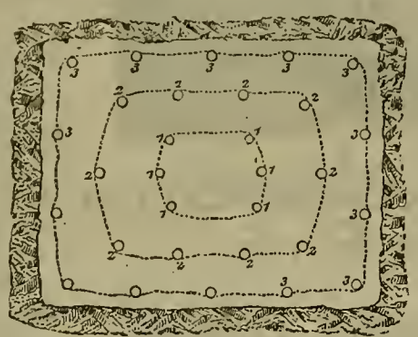


Fig. 1.



Fig. 2.



Fig. 4.



Fig. 3.

SECTION AND PLAN SHOWING BORE HOLES FOR BLASTING.

The longitudinal sectional elevations given in the drawings show clearly the position of the charges relatively to the unsupported faces of the rock. The plans are shown in Figs. 2, 3 and 4, where the holes corresponding to the letters in Fig. 1 are shown. These are from "Andre's Coal Mining."

It may be remarked here that, owing to the want of homogeneity in the rock, and to the existence of joints and fissures, in practice, the outer line of rupture will not run so regularly as indicated, in this assumed case, by the dotted lines. This circumstance will influence the position of the holes in the next series, and furnish an opportunity for the exercise of judgment on the part of the blaster.

There exist, also, other circumstances which will influence the position and the number of the holes in a very important degree, and which therefore must be taken fully into account at every advance. One of these is the irregularity of the face of the excavation. Instead of forming an unbroken plane at right angles to the direction of the heading or the shaft, this face is broken up by projecting masses and more or less deep depressions. Obviously these protuberances and cavities will influence, in no inconsiderable degree, the lines of least resistance, the latter being lengthened or shortened, or changed in direction by the presence of the former, which give existence to unsupported faces to which the lines may radiate. These conditions must in every case be taken into account when determining the best position for the bore-hole. Of yet greater importance is the existence of joint planes and bedding planes. It will be evident, from a consideration of the nature and mode of occurrence of these planes as described in the first chapter of this work, that they may constitute unsupported faces to which the lines of rupture may run. A bed of rock may be, and frequently is, cut up by these planes into detached blocks of greater or less dimensions, according to the more or less perfect development of the different sets. Hence it becomes necessary, in determining a suitable position for the blasting charge, to consider such planes as unsupported faces, and to ascertain the direction and the length of the lines of least resistence under such conditions. If a charge be placed in close proximity to one of these planes, not only may the lines of rupture run in unforseen directions, but the greater part of the force of the explosion will be lost by the escape of the gases along the plane. The same loss of force may be occasioned by the presence of a cavity, such as are of frequent occurrence in cellular or vughy rock. When the joint planes are fully developed, their existence can be ascertained by inspection; but when their development is imperfect, there may be considerable difficulty in discovering them. In such cases the rock should be carefully inspected, and sounded with a hammer or pick. When a cavity is bored into, it should be rammed full of clay, and the boring continued through the clay; or if sufficient depth has been obtained, the charge may be placed upon the clay, which will prevent the wasteful dissipation of the gases. As none of the aforementioned circumstances recur under precisely similar conditions, no general rules of much service can be laid down; they are matters upon which the blaster must be left to use his own judgment; and to do this effectively, it is obviously necessary that he possess some knowledge of the materials with which he deals.

A somewhat different mode of unkeying the face is occasionally adopted when the nitroglycerine compounds are employed as the explosive substance. In such cases, instead of angling the holes in the center of the face, these are bored, three or four in number, close together. When fired with a charge of the strong explosive, the thin partitions of the rock between the holes, and the rock immediately surrounding these to a slight depth, are crushed to dust by the force of the explosion, leaving a large hole in the center of the face, to serve as the cavity caused by the removal of the key in the former case. The relatively small diameter of the hole, however, affords a less extent of unsupported face than the cavity, and for this reason, as well as that of the small useful effect produced by these first charges, the method must be considered as wasteful of explosive material. The only justification for its adoption is to be found in the increased convenience of execution afforded by the perpendicular direction of the holes, in certain circumstances, when machine drills are used.

The Mineral Exposition.

A Creditable Display at the State Mining Bureau.

Notwithstanding the difficulties under which the State Mineralogist labored in preparing for a special display of minerals during the Conclave, he has succeeded beyond his expectations in getting together a collection which is admired by all who see it. The attendance has been very large and the visitors appreciative. To very many of them the whole mineral display is entirely novel, and they see many things never before examined.

There are some 87 cases altogether, and there are tables through the center and down the sides of the main room for the larger specimens that may be handled. Aside from the minerals there are many other things worthy of examination and which attract attention. A number of persons who have visited the rooms declare the exhibition of minerals to be much ahead of that at Denver last year. While there, there were large masses of ore, etc., the variety and excellence was by no means as good.

Taken altogether, the Mining Bureau has done itself credit in affording our visitors so excellent a chance to view our mineral products. California is the most largely represented, as might be expected, and by far the best display of any one county is that of Inyo, which has equal to six cases of minerals—or four cases and a large table. It would be impossible to go into any great detail in a single article like this, but we will endeavor to give, briefly, a sketch of what is shown by the

Counties of this State.

Though many of them are not, by any means, as fully represented as they should be. On a future occasion we shall go more into detail; but what follows will show the variety of our mineral products, and, to some extent, the comparative mineral resources of the counties, which we report in alphabetical order.

Alameda, Alpine and Amador.

Alameda county shows salt, cement, chrome iron, carbonate of magnesia.

Alpine county exhibits enargite, silver ores, and crystallized diallogite, a very rare mineral; also gold ores.

Amador shows gold bearing pyrites, handsome marble, iron ore, gold sands, lonite coal, chrome iron, clays, copper ore, rich gold ore and diatomaceous earth.

Butte, Calaveras, Colusa and Contra Costa.

Butte county has a case for itself and shows a number of very interesting things, among them gold platinum, diamondiferous sands, diamonds both cut and uncut, pyrites, gravel, cement, iron, asbestos, slate, gold amalgam, retorted gold and placer gold. The Spring Valley mine of Cherokee figures largely here.

Calaveras has rich gold ores, limestones, marbles, stalactites, copper ores which are very rich; a "cat's eye" the most beautiful ore ever found in the State; fine iron ores; splendid manganese, yellow ocher and steatite.

Colusa shows very rich copper and gold ores. There is also ore from the curious Sulphur Creek mine, where there are such interesting geological features, and a mine is being manufactured, so to speak. Gold and cinnabar are associated in the ore.

Contra Costa has only copper ores, coal and clays.

Del Norte, El Dorado and Fresno.

Del Norte has a small display of very rich copper ores and mica.

El Dorado exhibits mica, copper, chrome iron, Roscoelite, limestone and marbles, pyrites of iron with gold on the faces, magnetite, clay, talcose slate, gold ores and mispickel.

Fresno has molybdenite, zircon sand, andelusite, steatite, rich gold quartz, chrome iron and cinnabar.

Humboldt, Kern, Lake and Lassen.

Humboldt county has no reputation as a mining county, yet it brings forward gold ores, platinum and actinolite.

Kern county has many rare and beautiful marbles, lithographic stone, kaolin, steatite, gypsum, antimony, silver ores, gold, galena and garnet sands.

Lake county has plenty of cinnabar and sandstone, native sulphur, diatomaceous earth, obsidian clays and ornamental stone.

Lassen county exhibits limestone, lignite, rich gold quartz, etc.

Inyo County.

Inyo county has the best display, as stated, among the counties. It consists principally of gold and silver ores. It is astonishing to think that one county of the State could have within its borders so great a variety of ores. There are specimens from many different mines at different depths. The whole collection is of so much interest that we reserve it for a special description in another issue.

Los Angeles, Marin and Mariposa.

Los Angeles sends up some very handsome pink calcite, gypsum, garnets, vivianite, steatite, erythrite, alum, mica, galena, magnetite, manganese, antimony, copper glance, sederite and diatomaceous earth.

Marin shows some fine steatite, and stone suitable for pavements and building, oxide of manganese, good clay, gasper and copper ores.

Mariposa exhibits gold, building stone in variety, granite, feldspar, quartz crystals, copper, manganese, gold and aluminium.

Mendocino, Monterey and Mono.

From Mendocino are sent gold bearing beach sands, gold platinium, zircons and lignite.

Monterey county shows fine sands for glass making, clays, bituminous shale, gypsum, coal, white marble, crude petroleum and carbonate of magnesia.

Mono county has two cases of its own of very fine minerals principally gold and silver ores from different mines. The display is very creditable and we shall allude to it hereafter more fully.

Napa, Nevada, Placer and Plumas.

Napa shows cinnabar, manganese, iron, silver (?), obsidian, basalt, jasper and gold.

Nevada county is very poorly represented, and it is its own fault. As our leading mining county, its citizens should have taken some interest in the matter. Gold is shown from several mines, gold cement, very fine porcelain clay, iron ores, copper cement, etc. A whole set of products of Spenceville copper mine, illustrating the metallurgy of copper, is shown. Some fine steatite is also exhibited, calcite, manganese, building stone, scheelite, a very rare mineral, and the first ever found in the State; sulphate of baryta, marbles and silicified wood.

Placer county exhibits steatite for fire-proof materials, diorite, granite, good building stones, fine fire clays, marbles, iron, lonite, white sands for glass, magnetite, nickel, copper ore, chrome iron, silicified woods, gold ores in great abundance, free gold, salt water from springs, hydraulic concentrations and crystallized iron.

(Continued on Page 124.)

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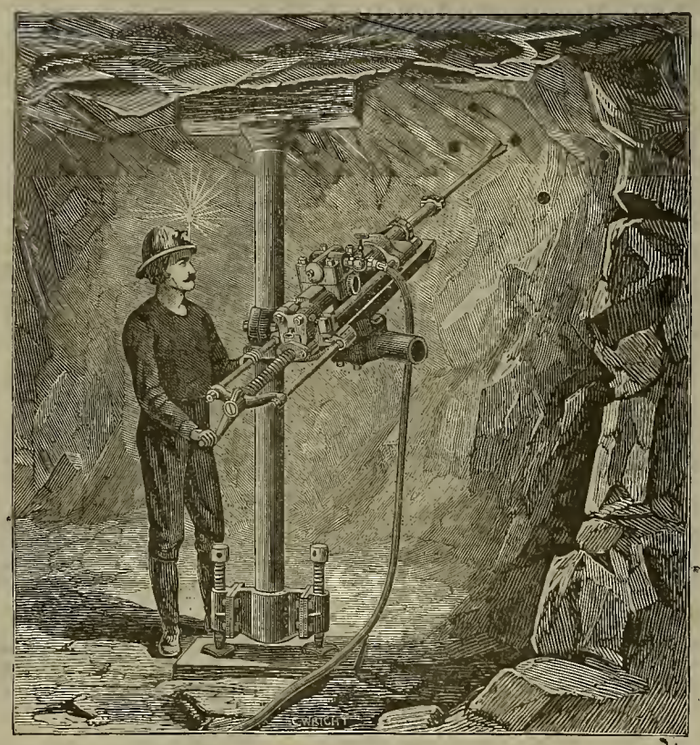
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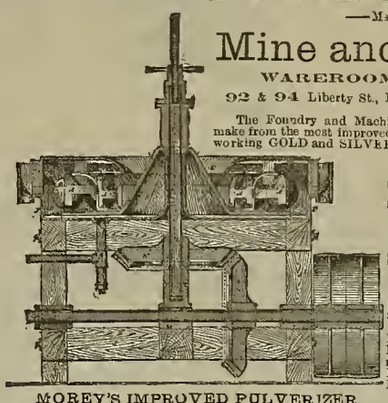
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HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in use, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fumes, notwithstanding bombastic and pretentious claims by others.

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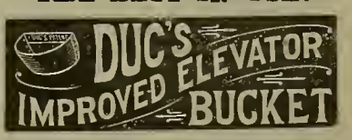
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This is the only Scientifically Constructed Bucket in the market. It is struck out from charcoal stamping iron. No corners to catch. No seams to burst. No interior corners to clog up. It runs with great ease, and half the power of the old style bucket. WILL OUTWEAR HALF A DOZEN OF THEM.

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING AUGUST 14, 1883.

283,188.—TONGUE SUPPORT—D. C. Ballard, Centerville, M. T.

283,197.—SAW PLATE AND INSERTED SAW TOOTH—J. J. Bowen, S. F.

283,069.—HARROW—Brown & Williams, Roseville, Cal.

283,365.—SASH FASTENER—Fred'k Dudley, Eugene City, Or.

283,221.—SAW HANDLE—Jas. N. Dudley, Petrolia, Cal.

283,335.—HASP LOCK—J. C. Franklin, Lena, Or.

283,095.—BAG SEWING MACHINE—H. P. Garland, San Quentin, Cal.

282,983.—STEP-LADDER AND HOIST—E. D. Haven, Albany, Or.

282,985.—FLUID METER—F. G. Hesse, Oakland, Cal.

283,112.—CAN HOLDER—Ivey & Uren, Seattle, W. T.

283,252.—SEAM FOR UNITING PIECES OF LEATHER—Quan Kai, S. F.

283,349.—CHRONOMETER ESCAPEMENT—A. W. Kientoff, Dalles, Or.

283,257.—COMPOUND PUMP—H. C. Langrehr, S. F.

283,120.—SAFE—Lauth & Hardy, S. F.

283,128.—LOCK HINGE—E. E. Masters, Woodland, Cal.

283,300.—HYDRAULIC PILE DRIVER—Surprenant & Ferguson, Astoria, Or.

283,180.—ORE FEEDER—Wm. E. Wild, S. F.

10,518.—TRADE MARK—J. R. Williams, Stockton, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Pateut Agency, the following are worthy of special mention:

SAFE.—John N. Lauth, Howard, Center Co., Penn., and Orlando B. Hardy, S. F. No. 283,120. Dated Aug. 14, 1883. A chamber is formed in the earth below the surface and surrounded by masonry, or other suitable substance of considerable thickness. It is preferred to build within this structure chilled iron plates, so as to make it entirely burglar-proof if the masonry should be partly dug away, while the masonry will be sufficient to make it fire-proof. This chamber is sufficicutly large to receive the safe, which is exactly fitted to it, and may he lowered into it or raised above the surface. The safe may be made comparatively light and have doors on more thau oue side, so its contents may be easily reached without the necessity of standing room withiu it. The safe may all be made of comparatively thin material except the top, which is heavy and thick. When the safe is lowered iuto the chamber it will he as nearly fire and burglar-proof as possihle. It is raised by hydraulic or other pressures.

HARROW.—Timothy S. Brown and George Williams, Roseville, Placer Co., Cal. No. 283,069. August 14, 1883. This inprovement in harrows consists in the construction of the tooth-bolding bars, their shape, the means for receiving the teeth, and the braces and other details of construction. They inteud to couple several sections together, aud hy reason of their side bend, make the entire device cover appreciably more ground than it would if it were straight. The sections, beiug light, may be thus increased and a very effective implement provided.

LOCK HINGE.—Egbert E. Masters, Woodland, Yolo Co. No. 283,128. Dated Aug. 14, 1883. These improvements in lock hinges are in the pawl and rachet mechanism by which it operates. The object is to provide a useful hinge for screen or inside doors, window blinds, gates, etc., which require to be held open temporarily. The door may be kept closed or in any desired positiou.

THE best Spring medicine known is that wonderful tonic, Brown's Iron Bitters.

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G. W. MCGREW—Santa Clara county.
M. P. OWEN—Santa Cruz county.
J. W. A. WRIGHT—Merced and Tulare counties.
JARED C. HOAG—California.
B. W. CROWELL—Colorado, Utah and Montana.
M. H. JOSEPH—Eureka, Nev.
L. M. LEIBY—San Bernardino and San Diego counties.
J. J. BARTELL—Yolo county.
E. P. BILLINGS—San Luis Obispo Co.
REV. S. GOODENOUGH—Santa Clara county.
H. W. FOLSOM—Los Angeles county.
C. E. CURTIS Kern and Inyo counties.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions The pavilion has new varieties of performances The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

The Mineral Exposition.

(CONTINUED FROM PAGE 121.)

Plumas shows copper, magnetite, gold quartz and hematite.

Sacramento, San Benito and San Diego.

Sacramento exhibits chrome iron, gneiss, granite, gypsum and hornblende.

San Benito shows stihnite, limestone, magnetite, nickel ore(?) and lignite.

San Diego county has quite a collection. It exhibits gypsum, selenite, copper, diatomaceous earth, pumice stone, chalcedony, gold quartz, copper, magnetite, stalactites from mud volcanoes. The very rare mineral lepidolite and blue calcite.

San Francisco, Sau Bernadino and San Joaquin.

San Francisco county has polished specimens of serpeutine, picrolite, pumice, hydro magnesite, jasper, building stone, and the first fossils found on the peuinsula.

San Bernardino county has cases of its own, and a very attractive and elegant display of Calico and Providence Mountain ores. One of the cases was paid for hy subscription, and the other by Mr. Ewing, of Providence Mountain, a phhlic spirited gentleman. In addition to the ores referred to, there is shown the first nitrate of soda found in the State, natural crystals of borax, copper ore and refined horax.

San Luis Obispo, San Mateo and Santa Barbara.

San Luis Ohispo exhibits mineral waters, dolomite, onyx, petroleum, asphaltum, aurifer-ous pyrites, clays, chrome iron, silver and cinnabar.

San Mateo contrihutes limestone, crude petroleum, zinc blende, huilding stone and chrome iron.

Santa Barbara shows quicksilver, picrolite, gypsum, diatomaceous earth and asphaltum.

Santa Clara, Santa Cruz, Shasta and Sierra.

Santa Clara county exhihits chrome iron, Iceland spar, gypsum, lignite, copper, steatite, sandstones, quicksilver ores, antimony and iron.

Santa Cruz only shows limestones.

Shasta, also, has limestones, copper, magnetite, iron, asbestos, silver and gold.

Sierra has good gold specimens, chrome irou, lead and cement with gold.

Siskiyou, Solano, Sonoma, and Stanislaus.

Siskiyou county exhibits gold, basalt, calcite, platinum, chrome iron, jasper and aragonite.

Solana has in her display the first bloodstone ever found in the State. She has onyx marble, too.

Sonoma shows chrome iron, cinnabar, steatite, actinolite, copper, paint rock, clay, diatomaceous earth, hornhlende, obsidian, graphite, jaspers and mangancse.

Stanislaus shows gypsum and telluride ores.

Tuolumne, Trinity and Tulare.

Neither Tehama nor Sutter counties are represented.

Trinity has cuprite in native copper.

Tulare exhibits silver, iron, steatite, zinc blende, asbestos, rose quartz, copper, stilnite, jeffriesite and silver.

Tuolumne county has one case of its own. In it are marble, magnesite, kaolin, magnetite, sandstone, chalcedony, gold quartz and sulphurets. The gold specimens are mainly from the Soulshy mine, the superintendent of which, John Leechman, paid for the case himself. The Soulsby company gave most of the specimens.

Ventura, Yuba and Yolo.

Ventura county exhibits gold, galena, silver and gypsum. Yuba contributes gold. Yolo has cinnahar, aragonite—which is one of the rarest minerals known—metacinnabarite, gypsum, iron and steatite.

We have not space on this occasion to go into more detail concerning the general exhibit. There are several private collections, each of great interest; cases with fossils and ethnological specimens, flasks and pans of quicksilver, cases of shells, birds and a great quantity of interesting things, descriptions of which we shall reserve for a future number of the PRESS.

A TRUE tonic medicine, a blessing in every household, is Brown's Iron Bitters.

Newspaper Agents Wanted.

Extra inducements will be offered for a few active canvassers who will give their whole attention (for a while at least) to soliciting snbscriptions and advertisements for this journal and our other first-class popular newspapers. Apply soon, or address this office, giving address, age, experience and reference.

DEWEY & Co., Publishers,
No. 252 Market St., S. F.

News in Brief.

THE new cable road on Market street in this city began running on Tuesday.

THERE was a destructive cloudhurst at Silver King, A. T., on Tuesday evening.

DAKOTA, it is thought, will give a yield of over 17,000,000 bushels of grain this year.

THE Arizona and New Mexico road is completed to within five miles of Clifton, A. T.

THE Empress Eugenie has gone to Carlshad. She is breaking down from dyspepsia and depression. An American doctor has been called to attend her.

THREE thousand five hundred tons of machinery material have arrived at Colon for the canal, and they expect twenty-five hundred tons more shortly.

THE members of Plymouth church have unanimously indorsed the proposition to extend the vacation of their pastor, Henry Ward Beecher, so he can lecture.

THE total exports from the United States to South America during the last fiscal year were $23,808,000, as against $46,829,000 from France, and $80,596,000 from England.

THE largest sailing regatta ever held in the world took place off Marblehead Saturday, under the auspices of the Beverly Yacht Club. Of 237 vessels entered, 158 started.

DR. BAYOL writes that he has traversed a large and unexplored tract on the left bank of the Niger, and has placed the whole country as far as Sego under the protection of France.

CASSIMICIOLA is a town on the island of Ischia, which was recently destroyed by an earthquake, is rapidly being rebuilt and already 154 wooden houses have been erected and occupied.

REPORTS of the harvest prospect from all parts of Ireland are very encouraging. In the northern, the midland and southern counties, the crops are full and promising. The potato yield is large.

THE King of Bavaria has ordered a single private performance of "Parsifal" at the opera-house at Munich, with all the original scenery and scenic effects. The King sits alone in a curtained hox unseen. It costs him $12,000.

THE new postal notes will be ready for circulation Septemher 3d next. They are now being secured in books of 500 each, and distrihuted through the registration division of the New York postoffice to the postmasters of the country.

THE Northern Pacific issues a circular that connection will be made 60 miles west of Helena, M, T., by the 25th, and the road will be ready to receive frcight on and after the same date, to and from all points in the Pacific Northwest.

THE mayors of Fargo, Grand Forks, Bismarck, Tower City and Jamestown have signed a call for a eouvention of representative men of the region lying north of the forty-sixth parallel to take measures to protect the interests of northeru Dakota.

THE Londoners have taken to the Thames throughout the summer months, and eat, drink and sleep in what are known as house hoats. These usually contain a snug dining-room and sitting-room combined, two or three small bedrooms, a kitchen, and a veranda.

INFORMATION is wanted at this office of one Joseph Craig, formerly of Cass county, Illinois, who came to California in 1849.

PRINTERS, AUTHORS, INVENTORS, PATENTEES, BUILDERS, MANUFACTURERS, MACHINISTS, MERCHANTS, and other trades-people can have satisfactory Engravings and Electrotypes made at moderate prices by the S. F. ENGRAVING Co., No. 405 KEARNY ST. Send photographs, sketches, drawings, models or samples for estimates. Map and Woodcut Engravings enlarged or reduced by the aid of photography, at less than one-half the cost of the originals and in a short time. Photo-relief, Zincograph and other improved methods employed.

Cheap Ore Pulverizer.

There is for sale in this city, by I. A. Heald, American Machine and Model Works, 111 and 113 First St, a Rutherford Pulverizer, an improved revolving barrel crusher, which was only used a few times and is as good as new. It will be sold very much below cost, and miners who are in need of such an appliance for a small mine will do well to make inquiries concerning it. It is suitable for a pulverizing mill for powder or other substances. Reference as to above can be had upon applying to this office.

Stock and Grain Land.

Parties wishing to purchase good stock raising lands, unaffected by severe drouths, will do well to address the undersigned. The lands can be purchased cheap, in lots from 100 to 2,000 acres. It is partly low table and rolling land, partly clear and level. Good for vine and fruit raising. Will raise vegetables and all kinds of grain. Crops certain every year. Near town and a $10,000 public school house. Price, $3 to $5 per acre. Good local market for fruit, vegetables, grain, poultry and dairy produce. Address the proprietor,

EDWARD FRISBIE,
Anderson, Shasta Co., Cal.

Mining Books.

Orders for Mining and Scientific Books in general will be supplied through this office at published rates.

SUFFER

no longer from Dyspepsia, Indigestion, want of Appetite, loss of Strength lack of Energy, Malaria, Intermittent Fevers, &c. BROWN'S IRON BITTERS never fails to cure all these diseases.

Boston, November 26, 1881.
BROWN CHEMICAL CO.
Gentlemen:—For years I have been a great sufferer from Dyspepsia, and could get no relief (having tried everything which was recommended) until, acting on the advice of a friend, who had been benefitted by BROWN'S IRON BITTERS, I tried a bottle, with most surprising results. Previous to taking BROWN'S IRON BITTERS, everything I ate distressed me, and I suffered greatly from a burning sensation in the stomach, which was unbearable. Since taking BROWN'S IRON BITTERS, all my troubles are at an end. Can eat any time without any disagreeable results. I am practically another person. Mrs. W. J. FLYNN,
30 Maverick St., E. Boston.

BROWN'S IRON BITTERS acts like a charm on the digestive organs, removing all dyspeptic symptoms, such as tasting the food, Belching, Heat in the Stomach, Heartburn, etc. The only Iron Preparation that will not blacken the teeth or give headache.

Sold by all Druggists.

Brown Chemical Co.
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See that all Iron Bitters are made by Brown Chemical Co., Baltimore, and have crossed red lines and trade-mark on wrapper.

BEWARE OF IMITATIONS.

18th Industrial Exhibition
—AND—
Mechanics' Fair
of San Francisco, 1883,
Will Open at the NEW PAVILION on Larkin, Hayes, Polk & Grove Sts.,
—ON—
TUESDAY.....SEPTEMBER 11th
And Continue until October 13th.

This will be the most comprehensive Exposition yet held in this State of Manufactures, Art and Natural Products. A GRAND CONCERT and other extra attractions each afternoon and evening.

PREMIUMS.

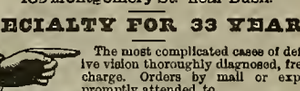
A liberal list of Premiums, consisting of Gold, Silver, and Bronze Medals, Diplomas, and Cash, will be awarded to meritorious exhibits.

Members of the Mechanics' Institute, in good standing, are entitled to double and single season tickets at half rates.

Intending exhibitors should lose no time in applying for space.

Full information will be given and sent on application to the Secretary, 31 Post Street.

P. B. CORNWALL, President.
J. H. CULVER, Secretary.

Only "PEBBLE" Establishment.
1863  1883
Muller's Optical Depot,
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SPECIALTY FOR 33 YEARS.

The most complicated cases of defective vision thoroughly diagnosed, free of charge. Orders by mail or express promptly attended to.
Compound Astigmatic Lenses Mounted to Order. Two Hours Notice.
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PATENTS obtained promptly; Caveats filed expeditiously; Patent Reissues taken out; Assignments made and recorded in legal form; Copies of Patents and Assignments procured Examinations of Patents made here and at Washington; Examinations made of Assignments recorded in Washington; Examinations ordered and reported by Telegraph; Rejected cases taken up and Patents obtained; Interferences Prosecuted; Opinions rendered regarding the validity of Pateuts and Assignments; Every legitimate branch of Paten Soliciting promptly and thoroughly conducted.

Our intimate knowledge of the various inventions of this coast, and long practice in patent business, enable us to abundantly satisfy our patrons; and our success and business are constantly increasing.

The shrewdest and most experienced Inventors are found among our most steadfast friends and patrons, who fully appreciate our advantages in bringing valuable inventions to the notice of the public through the columns of our widely circulated, first-class journals—thereby facilitating their introduction, sale and popularity.

Foreign Patents.

In addition to American Patents, we secure, with the assistance of co-operative agents, claims in all foreign countries which grant Patents, including Great Britain, France, Belgium, Prussia, Austria, Baden, Peru-Russia, Spain, British India, Saxony, British Columbia, Canada, Norway, Swoden, Mexico, Victoria, Brazil, Bavaria, Holland, Denmark, Italy, Portugal, Cuba, Roman States, Wurtemburg, New Zealand, New South Wales, Queenslautl, Tasmania, Brazil, New Granada, Chile, Argentino Republic, AND EVERY COUNTRY IN THE WORLD where Patents are obtainable.

No models are required in European countries, but the drawings and specifications should be prepared with thoroughness, by able persons who are familiar with the requirements and changes of foreign patent laws—agents who are reliable and thoroughly established.

Our schedule price for obtaining foreign patents, in all cases, will always be as low, and in some instances lower, than those of any other responsible agency.

We *can and do* get foreign patents for inventors in the Pacific States from two to six months (according to the location of the country) SOONER than other agents.

The principal portion of the patent business of this coast has been done, and is still being done, through our ageucy. We are familiar with, and have full records, of all former cases, and can more correctly judge of the value and patentability of most inventions discovered here than any other agents.

Situated so remote from the seat of government, delays are even more dangerous to the inventors of the Pacific Coast than to applicants in the Eastern States. Valuable patents may be lost by extra time consumed in transmitting specifications from Eastern agencies back to this coast for the signature of the inventor.

Confidential.

We take great pains to preserve secrecy in all confidential matters, and applicants for pateuts can rest assured that their communications and busiuess transactions will be held strictly confidential by us. Circulars of information to inventors, free.

Home Counsel.

Our long experience in obtaining patents for Inventors on this Coast has familiarized us with the character of most of the inventions already patented; hence we are frequently able to savo our patrous the cost of a fruitless application by pointing to them the same thing already covered by a patent. We are always free to advise applicants of any knowledge we have of previous applicants which will interfere with their obtaining a patent.

We invite the acquaintance of all parties connected with inventions and patent right business, believing that the mutual conference of legitimate business and professional men is mutual gain. Parties in doubt in regard to their rights as assignees of pateuts or purchasers of patented articles, cau often receive advice of importance to them from a short call at our office.

Remittances of money, made by individual inventors to the Government, sometimes miscarry, and it has repeatedly happeued that applicants have not only lost their money, but their inventions also, from this cause and consequent delay. We hold ourselves responsible for all fees entrusted to our agency.

Engravings.

We have superior artists in our employ, and all facilities for producing fine and satisfactory illustrations of inventions and machinery, for newspaper, hook, circular and other printed illustrations, and are always ready to assist patrons in bringing their valuable discoveries into practical and profitable use.

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United States and Foreign Patent Agents, publishers Mining and Scientific Press and Pacific Rural Press, 252 Markct Street. Elevator, 12 Front St., S. F.

"Challenge" Ore Feeders.

OVER 1100 HAVE BEEN IN SUCCESSFUL OPERATION.

Awarded First Premiums at the Preceding and last Industrial Fairs of the Mechanics' Institute of San Francisco.

TWENTY PER CENT. MORE ORE CRUSHED WITH FIFTEEN PER CENT. LESS WEAR OF IRON THAN BY THE OLD METHOD OF HAND-FEEDING.

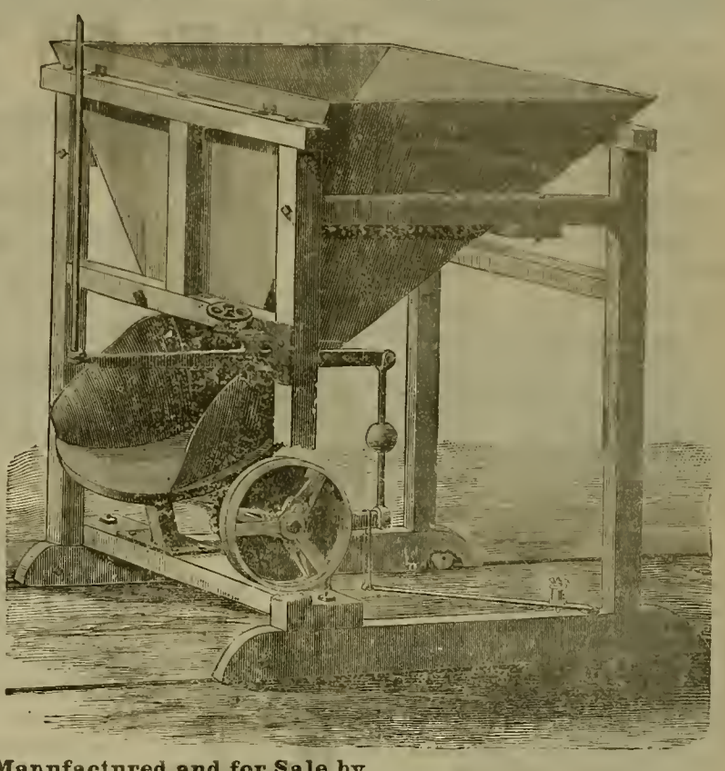
The opposite cut illustrates the recently-introduced Gripand-Boring Attachment, which replaces the Weight originally used and result in an obvious improvement.

The practical operation of the large number of these machines now in use demonstrates the fact that the principle upon which a perfect Ore Feeder must be constructed is that of a *carrier* and not that of a shaking table. Uniform feeding is impossible upon the latter plan. The ore must be *evenly carried* upon a steadily advancing platform table to the line of point of discharge, and there be simply dropped. Jerky or spasmodically acting contrivances will not answer the purpose for feeding wet or sticky ores, nor for the ores of mines where they may change from sharp quartz to an intensely tough material of quartz and earthy matter.

The Feeders are in Successful Practical Operation in the Following Quartz Mills, and are giving Perfect Satisfaction to their Managers.

Compromise	10 Stamps.	Mariposa county, Cal.	
Soulsby	20 "	Tuolumne	" "
Patterson	20 "	"	" "
Sheep Ranch	20 "	Calaveras	" "
Mahoney	40 "	Amador	" "
Zelle	40 "	"	" "
Pacific	40 "	"	" "
Nashville	20 "	El Dorado	" "
Gross	80 "	"	" "
Julian	20 "	Placer	" "
St Patrick	15 "	"	" "
Providence	10 "	Nevada	" "
Empire	20 "	"	" "
Idaho	30 "	"	" "
Green Mountain	60 "	Plumas	" "
Plumas-Eureka	60 "	"	" "
Bulwer-Standard	30 "	Bodie, Mono,	"
Standard	20 "	"	"
Noonday	30 "	"	"
Big Dry Creek	10 "	Fresno	" "
Mexican	14 "	Lyon county, Nevada.	
Santiago	32 "	"	" "
Vivian	16 "	"	" "
Christy	5 "	Utah county, Utah.	
Contention	20 "	Tombstone, Arizona.	
Grand Central	20 "	"	"
Sunshine	20 "	Black Hills, Dakota.	
Homestake	200 "	"	"
Father de Smet	80 "	"	"
Hidden Treasure	40 "	"	"
Highland	120 "	"	"

And in many other Mills in the Mining Districts of the entire United States, and as well in Nova Scotia and Australasia. The superiority of these Feeders over others manufactured has been so thoroughly demonstrated that it is not deemed pertinent to cite the numberless instances of this fact.



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Manufacturers of Quartz, Saw Mill and General Machinery. Agents for "BAKER" ROTARY PRESSURE BLOWERS, WILBEARHAM ROTARY PISTON PUMPS, P. BLAISDELL & CO.'S MACHINISTS' TOOLS, and the Celebrated "HOT POLISHED SHAFTING," from the Akron Iron Company, Akron, Ohio. Also Manufacturers of New and Dealers in Second-Hand Boilers, Engines and all Descriptions of Machinery.

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Mining Companies.

Persons interested in inco.porations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company.

San Francisco, August 2, 1883.

At a meeting of the Board of Directors of the above named company held this day, Dividend No. 57, of twenty-five cents (25c.) per share, was declared, payable MONDAY, Aug. 13, 1883, at the Farmers' Loan and Trust Company, in New York, or at the office in this city.

WILLIAM WILLIS, Secretary.

OFFICE—Room No. 29, Nevada block, No. 309 Montgomery street, San Francisco, Cal.

ASSESSMENT NOTICE.

Seaton Gold Mining Company.—Location of principal place of business, San Francisco, California; location of works, Drytown, Amador county, Cal.

NOTICE is hereby given that at a meeting of the Board of Directors, held on the 31st day of July, 1883, an assessment (No. 5) of eight cents (8c.) per share was levied upon the capital stock of this corporation, payable immediately in United States gold coin, to the Secretary at the office of the Company, Room 6, 523 California St., San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 5th day of September, 1883, will be delinquent and advertised for sale, at public auction, and unless payment is made before, will be sold on Thursday, the 27th day of September, 1883, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

A. MARTIN, Secretary.

OFFICE—Room 6, 523 California Street, San Francisco, California.

FOR SALE.

Globe Iron Works,

Foundry, Machine, and Blacksmith Shop.

COR. MAIN AND COMMERCIAL STS.,

Near Steamboat Landing, . . STOCKTON, CAL.

Apply to **JOHN CAINE, Prop.**

Patent Life-Saving Respirator.

PREVENTS LEAD POISONING AND SALIVATION.



Invaluable to those engaged in dry crushing quartz mills, quicksilver mines, white lead corroding, feeding thrashing machines and all occupations where the surrounding atmosphere is filled with dust, obnoxious smells or poisonous vapors The Respirators are sold subject to approval after trial, and, if not satisfactory, the price will be refunded. Price, $3 each, or $30 per dozen

Address all communications and orders to

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43 Sacramento Street, San Francisco, Cal.

FOR SALE

By J. M. LAKENAN, of Grass Valley Foundry, Grass Valley, Cal.

One 20-inch bore engine, 24-inch stroke; one 18-inch bore engine, 40-inch stroke, Meyer's cut-off; one 14-inch bore engine, 36-inch stroke, Meyer's cut-off; two 12-inch bore engines, 30-inch stroke; two sets heavy pumping gear, with hob and connecting rod irons, etc.; 450 feet of 16-inch pump pipe of 4-inch iron, heavy flanges; besides other mining and milling machinery.

For information, address

J. M. LAKENAN,
Grass Valley, Cal.

MINES WANTED.

Two California Quartz Gold Mines for customers. Must be sufficiently developed to show value, and submitted with reports and 90-day bond.

MARS & LAWYER,
45 Merchants' Exchange, San Francisco.

REFERENCES—J. B. Haggin, Louis A. Garnett, John J. Valentine, Anglo-Californian and Donohoe, Kelly & Co.'s Banks.

L. PETERSON,

INVENTORS. MODEL MAKER,

238 Market St., N. E. cor. Front, up-stairs, San Francisco. Experimental machinery and all kinds of models, tin, copper and brass work.

W. E. CHAMBERLAIN, JR. T. A. ROBINSON.



Life Scholarships, $70.

PAID IN INSTALLMENTS, $75.

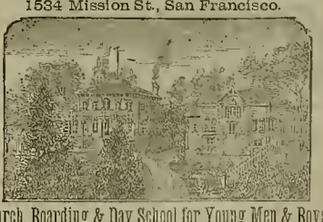
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SPECIAL NOTICE!

In Consequence of the Late Fire, we are Temporarily Located at the SYNAGOGUE Mason Street, between Post and Geary Streets, San Francisco.

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Church, Boarding & Day School for Young Men & Boys

Prepares for College and University. For information, address REV. E. B SPALDING, Rector.

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A FIRST-CLASS BOARDING SCHOOL FOR YOUNG LADIES.

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ROOT, NIELSON & CO.,
MANUFACTURERS OF
STEAM ENGINES, BOILERS AND ALL
Kinds of Machinery for Mining Purposes.
Flouring Mills, Saw Mills and Quartz Mills Machinery constructed, fitted up and repaired.
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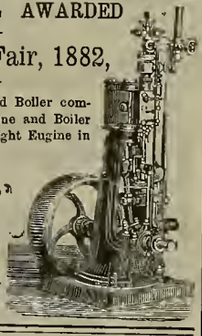
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Manufacture Iron Castings and Machinery of all Kinds at Greatly Reduced Rates.
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Golden State Pressure Blowers.
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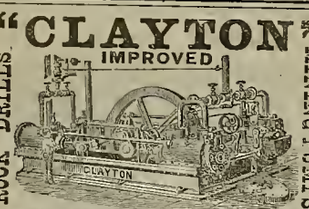
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California Machine Works,
WM. H. BIRCH,
Engineer and Machinist,
119 Beale Street, San Francisco.
Portable and Double Sawmills, Steam Engines, Flour, Quartz and Mining Machinery. Brodie's Patent Rock Crusher
PRICES GREATLY REDUCED.

No. 1	Crusher, 4 tons per hour	$450.00
" 2	" 6 " " "	625.00
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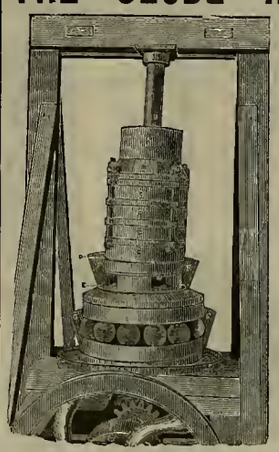
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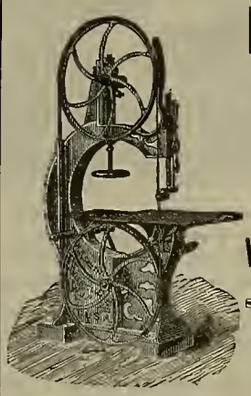
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—AT—
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THE CELEBRATED **A** BRAND.
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Manufacturers and Repairers of all Kinds of
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LOCOMOTIVES, HOISTING and MINING MACHINERY,
Portable, Stationary and Marine Engines,
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Berry & Place Machine Co.,
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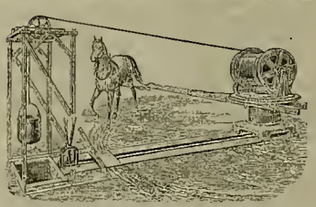
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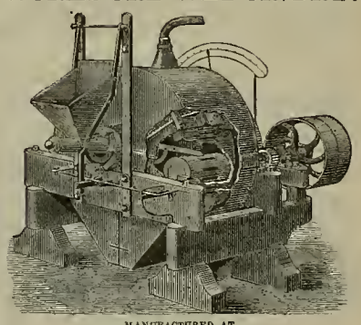
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Builders of Steam Machinery
IN ALL ITS BRANCHES,
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HIGH PRESSURE OR COMPOUND.
STEAM VESSELS, of all kinds, built complete with Hulls of Wood, Iron or Composite.
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STEAM BOILERS. Particular attention given to the quality of the material and workmanship, and none but first-class work produced.
SUGAR MILLS AND SUGAR-MAKING MACHINERY made after the most approved plans Also, all Boiler Iron Work connected therewith.
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THE MOST EFFICIENT AND PRACTICAL MACHINE ever invented for the service of Prospectors and others requiring the use of a Horse Power; possessing all the requirements of a first-class hoist and affording means for the continuous operation of a Pump or Blower without interfering with a hoisting apparatus.
It is made entirely of Iron; no piece weighs over 250 pounds. At the ordinary speed of a horse a 1,000-pound bucket of ore may be raised 120 feet per minute. The hoisting drum is under the complete control of the man at the shaft, and is capable of carrying 500 feet of five-eighths steel rope. The cost of erection is slight, as two men in half a day can easily put it in place ready for work.
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WORKS ORE WET OR DRY.

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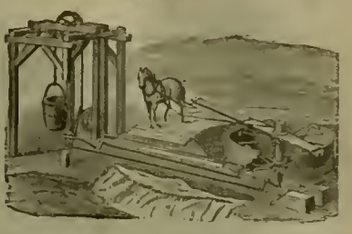
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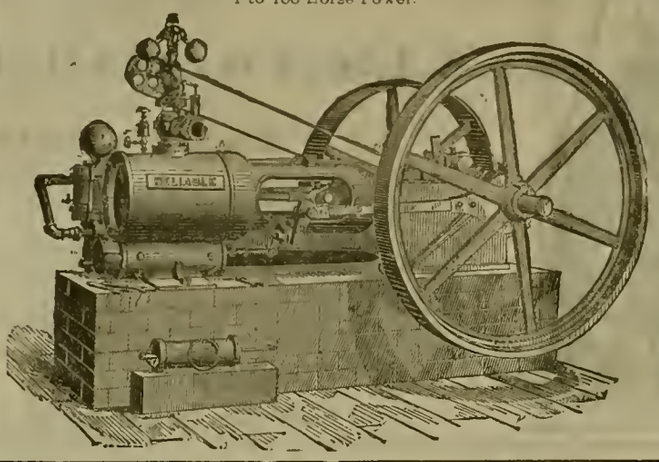
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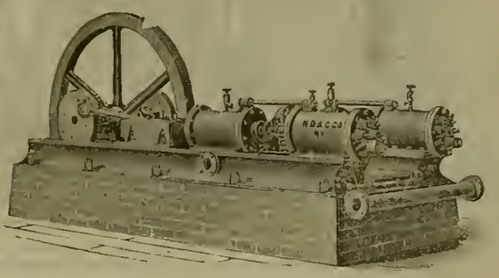
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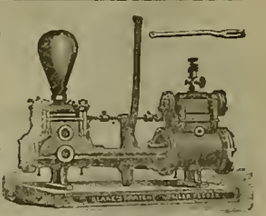


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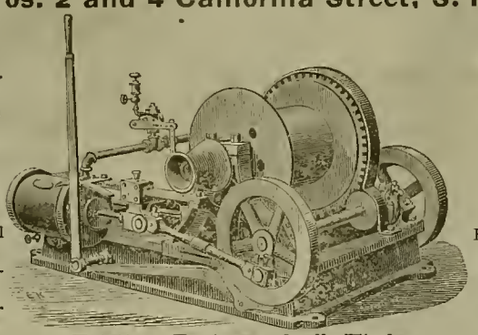


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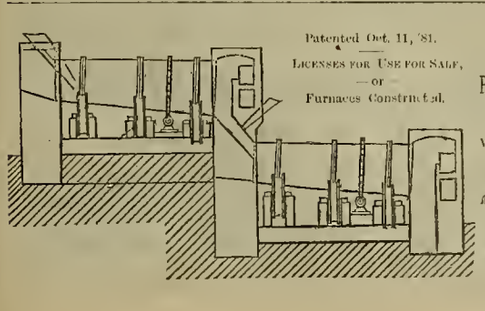
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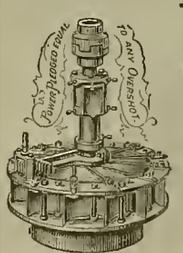
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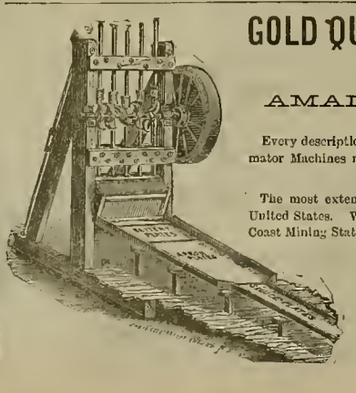
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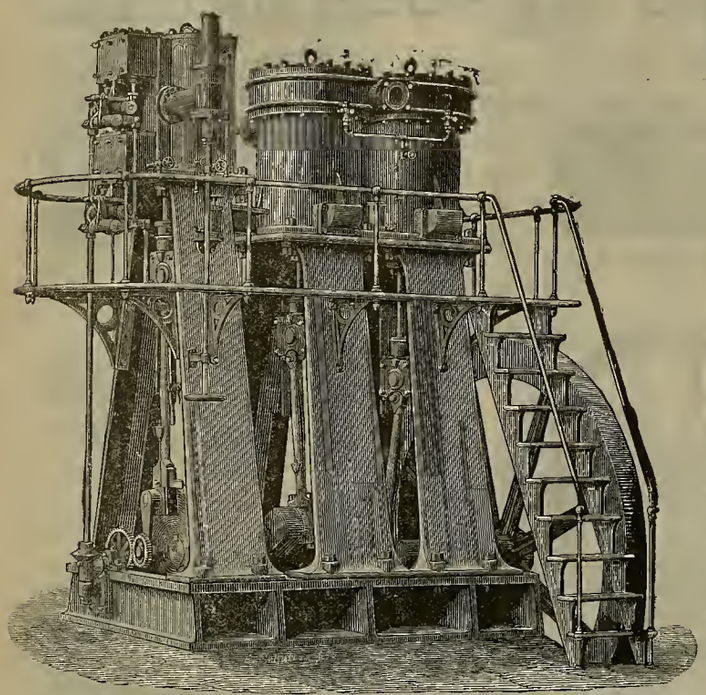
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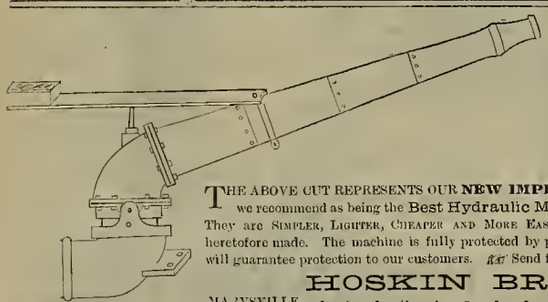
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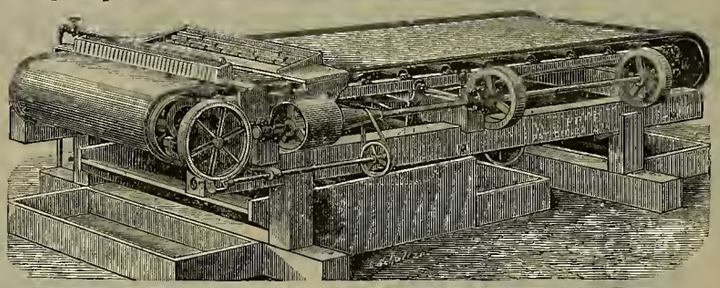
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To those intending to manufacture or purchase the so-called "Triumph" Concentrator, we herewith state:

That legal advice has been given that *all shaking motion* applied to an *endless traveling* belt used for concentration of ores is an infringement on patents held and owned by the Frue Vanning Machine Company.

That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.

That the patent laws make *users* of infringements responsible as well as makers, and the public is therefore warned that there is considerable risk in purchasing any end-shake machine until our various patents have been decided.

That if there are those who for any reason prefer an end-shake machine, we can manufacture and sell to such machine of that description, as efficient as the Triumph, and at a lower price, and no liability for infringement will then be incurred by the purchaser.

That we shall protect ourselves against any one making, selling or using any machine infringing any of our patents. Patented July 9, 1867; May 4, 1869; Dec. 22, 1874; Sept. 2, 1879; April 27, 1880. Patents applied for.

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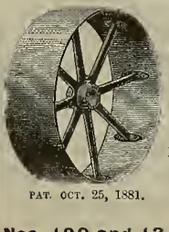
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PAT. OCT. 25, 1881.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

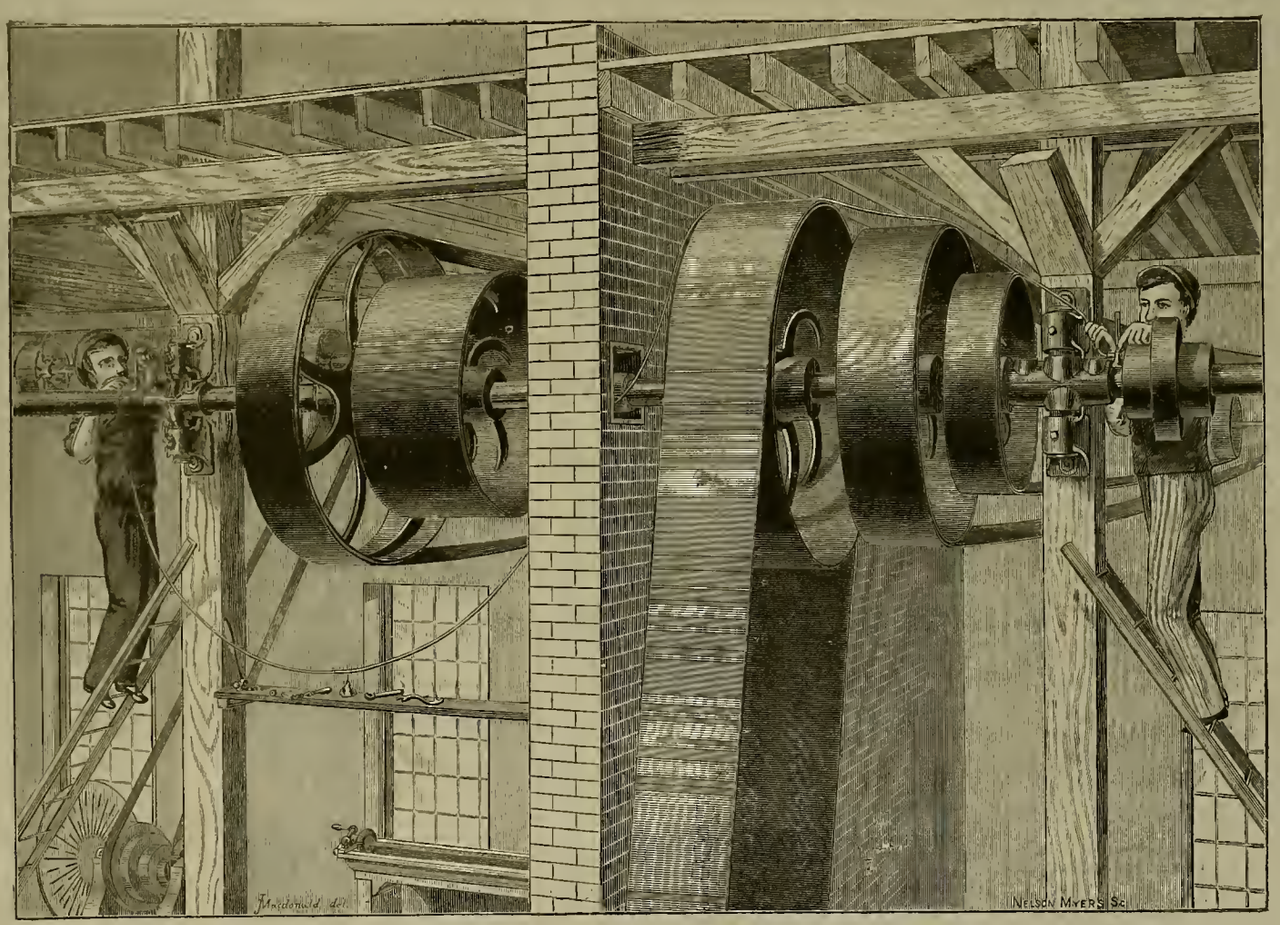
BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, SEPTEMBER 1, 1883.

VOLUME XLVII Number 9.

Macdonald's Hydrostatic Level.

A device for leveling that will be found very useful, particularly among those who are engaged in the erection of machinery, or have occasion to use a level in cramped and complicated positions, as well as for any other service to which the ordinary spirit level may be put, has lately been perfected and patented by Mr. Jas. Macdonald, of New York City. The cuts on this and page 137 give a clear idea of its application. Fig. 1 is a sectional and



APPLYING MACDONALD'S HYDROSTATIC LEVEL.

Fig. 2 an outside view of a standard, of which there are two for each level. In Fig. 1, A is a brass tube secured to the base B and slotted vertically on opposite sides at F, and as seen in Fig. 2. C is also a brass tube into which the conical valves E E are fitted, and it is slotted vertically, corresponding with A. The glass tube D is held between the valves E E by watertight joints of rubber at J J, and is graduated in thirty seconds of an inch, each quarter being numbered 1, 2, 3, etc., from the bottom; the graduations being placed opposite the slots in C. The upper conical valve contains the screwed cap H and a vent hole G, which, when in the position shown, communicates with the atmosphere through a corresponding hole in A, at the same time the lower valve opens a communication through the arm L, with the rubber hose M, by which the two standards are connected together. These holes or ports are closed by applying the thumb and fingers to the nurled edge of the cap H and turning to the right till the movement is restricted by the stop pin N, in the base B, which extends into a slot in the lower valve E. The tube C and the lower valve E may be separated to give access to the glass by removing the pin I. K is a loose ferrule by which the end of the rubber hose M is held on the arm L and attached to the standard. When in use, the level is kept constantly filled with water to a point about half way up the graduated gauges. The operation of filling may be easily performed by removing the cap H from the standards or by simply opening the valves in each and using the hose as a syphon. The valves E E are so arranged that the operation of screwing the caps in will close them.

The immediate functions of these valves are to prevent the escape of water when the level is not in use, and at the same time to confine whatever air there may be above its surface in the standard, so that it cannot become mixed with, or mechanically suspended in the water in the hose, which, if allowed, would prevent its surfaces from indicating the level. It will be seen that when the valves are closed the scale on the glass tube, which is the only part of it left uncovered, will be carried under the sides of the outer tube A, and be more effectually protected.

When the position of two points relative to a horizontal line is to be determined, a standard is placed on each, the valves E E are opened, which admits the atmosphere, and the water immediately finds its level. The difference in altitude, if any, between the points on which the standards are placed, will be the difference between the points on the graduated gauges at which the water rests. Thus, if 9 was indicated in one gauge and 6 in the other, the former would be three-quarters of an inch below the latter. The same results may be obtained by placing the top of the standard under the points to be leveled. As the basis of the standards are only 2″ in diameter, they may be used in small spaces and cramped positions, a condition that is often met with, especially in line shafting.

The flexible tube may be passed over, around or through any obstructions that there may be between the points to be leveled, and if extra length of hose is wanted it may be added by means of the coupling shown in Fig. 3, which consists of a short grooved nipple, on which the ends of the hose are stretched and held in position by means of the ferrules shown. The workmanship and finish is good in every particular, handsomely nickel-plated, and provided with a suitable case for keeping it in when not in use. Mr. Fred. A. Hodgson, 294 Broadway, New York, is the agent for the United States and Canada.

Kaolin Location.—A ledge formation of what is said to be kaolin has been discovered in the vicinity of Rush creek, two miles northwest of this city, and considerable excitement is being created over the development. A quarter section of land has been located there under the placer mining laws, while other parties have made quartz locations along the ledge for a distance of 6,000 feet. There is a ledge formation of clay varying in thickness from 50 to 80 feet, and inclosed between granite walls. A tunnel has been run into it in one place a distance of 25 feet, and Captain Moore, who worked in potteries in the old country, says the deposit is very valuable.—*Nevada Trans.*

John W. Mackay has been elected President of the Postal Telegraph Company, to fill the vacancy existing since the resignation of Joel B. Erhardt.

CORRESPONDENCE.

From the Southwest.

[From our Own Correspondent.]

From Prescott to Ash Fork is called 50 miles, and by some, 60 miles; the stage fare is $10; and the last 15 miles is so rough and rocky and the stuffing in the cushions, if any, is so very solid that you feel almost sure the seat is made of well-seasoned hard wood.

Mr. Stewart is the general agent, and all the drivers on the line through from Maricopa to Ash Fork seem so very courteous and careful for the comforts of travelers, it must be inferred that all the blame for the hard bumps and bruises must be divided between the road commissioners and the stage proprietor, Mr. Salsbury, of Benson. But the public just now feel wonderfully favorable toward Salsbury, and would say as long as he will drive on the furnace business with his fast increasing facilities to reduce all kinds of ores, and advance the cash on prospectors' samples, as well as on thousands of tons lots, as soon as sampled and assayed, we can excuse him for slight negligence in the matter of cushions in the coaches that are so soon to give place to palace car accommodations. The fashion followed by lady tourists of carrying a large pillow, with a gingham slip buttoned over it, is a very commendable part of stage and car outfit.

Leaving Prescott in a beating thunder storm, I did not occupy my engaged outside seat, and could see but a small portion of the fine scenery that we passed during the afternoon, before night closed in upon us. We could here and there see a very comfortable farm dwelling, painted white, and some small patches of corn and potatoes that were looking well, but the wrinkled corn leaves seemed to say, "want rain." We passed some valuable stock ranges where the water is sufficient and the range very extensive. There are now several from the outside States and Territories looking for stock land. The principal flowing waters are already appropriated, and now more or less digging will generally be necessary to get the required water supply. Once in five or ten years there may occur a very dry season, when both feed and water will be scarce.

The two Great Railroads now Running Across the Territory

Will offer some security for supplying a large amount of both feed and water. The A. and P. R. R. have a large number of tank cars for conveying water to many of their stations where as yet they have failed to get a supply. The stock of Arizona is greatly advanced in value as an investment, from the fact that when a dry year should happen it could be early provided for by importing by railroad some food, and exporting most of the stock in a yet merchantable condition. Those who distinctly remember the trials of journeying over hundreds of miles, and freighting provisions and household necessities and farming tools, can appreciate the advantages of a railroad as others cannot. The people in northern, middle and southern Arizona are today nearer San Francisco, Chicago, New York, or even nearer to Liverpool, than they previously were to Los Angeles or San Diego, their nearest points of supplies. Families and business men of means will not now dread the journey nor hesitate to make a sojourn in Arizona while in such easy nearness to any part of the world with railroad, mail and telegraph.

The Climate of Arizona

Varies much with the altitude, but the average of Arizona climate is very good, the wooded hills very pleasant and healthful. The miners in nearly, if not all of the mines, can work the entire year as far as cold or heat is concerned. I could better appreciate this important feature when I passed directly from the mines of Prescott and experienced the July sunshine on the Colorado river bottom at the Needles, on the border of the California desert. While the usual gauge of the thermometer is about 120°, and some claim a register of 132° in the shade, the thermometer was corroborated by the fact that the butter was melted as thin as olive oil, and handled only with a spoon, and the sand, as well as the lumber exposed to the sun, was too hot for the bathers' feet. Here at the Needles is where the Atlantic and Pacific ends, or rather joins the South Pacific, which, in connection with the Central Pacific, makes a short through route to San Francisco (now only lacking the completion of the bridge across the Colorado river, which is nearly completed). The Atlantic and Pacific begins at Albuquerque, in New Mexico, runs along the 35th parallel over an interesting and new route, although full of evidences of being one of the

Oldest Settled Portions of the Continent.

The cliff dwellers are gone, and left no record except their dwellings under the cliffs of the rocks—neat and well-built stone and mortar walls. These walls have well-shaped stones, square corners, and both sides smooth and even, with corners right-angled. From the measurement of several of these rooms, they seem to have preferred to have them right-angled parallelograms, with the length twice the width, but not at all uniform in size. One room measured was 8½x17 feet, another 5½x11 feet. These may join one to another under the same cliff, but do not communicate one with another by any inside doors. The outside entrance door is small—only large enough to admit a full-grown person; but this opening shows careful, true shaping, straight sides and parallel, but the lower line broken. This door was placed about two and a half feet above the floor. Above the door was a small opening to allow the smoke to escape.

About three miles from Casino station—a pleasant walk over level, rich grazing and sparcely timbered land—we come to an immense gorge in rocky strata, a deep canyon of bare and very

Precipitous Rocky Sides.

The channel more than 1,000 feet below the country level, was now dry, though the well worn rocks spoke of torrents that had rushed through there in very crooked channels. Standing on the edge of this chasm you can count many of these cliff dwellings built under the projecting strata, where a softer strata had fallen out, leaving an opening between the two solid strata. Here they had carefully walled up the front and sides, leaving only room to pass carefully in front to enter their small door. They certainly must have been very sober, for by one misstep they would be precipitated hundreds of feet below on craggy rocks. These lodges could none of them be reached by any direct descent from above, and no rock rolled or sent from above could reach them even when entering their dwellings and yet outside. It takes a good climber when piloted to the right place to make the descent to get to the bottom and then up to any of these dwellings.

No implements of any kind are now found, no inscriptions left. The pieces of pottery which abound may be that of more modern tribes, who may at some time have temporarily occupied these retreats.

There are several localities where are found these cliff dwellings. A correspondent of the Burlington *Hawkeye*, who was along, considered this one of the richest enjoyments of his trip, for he was satisfied that he and the guide, Scotty, climbed to one point where white man's feet had never before been—to an elevated plain and fortification, and probably what had been used as a storage for their provisions.

Game.

We saw no antelope, though they abound, but saw three gangs of wild turkeys; in two of them were broods of young ones.

Ash Fork, where the freight for Prescott is shipped by land schooners or trail wagons, is a P. O. town of perhaps twenty houses and cabins—several good beginnings for mercantile houses. Mr. M. Wood, the principal shipping agent, is an obliging, energetic, reliable business man, and has a large amount of merchandise and mining machinery to forward to different towns and mining camps in Yavapai county. The same amount of business would soon build up a town elsewhere; but here the expectation that a branch railroad will soon be built from this or some more convenient point to Prescott prevents any permanent improvements from being made here. As yet no efforts have succeeded in getting

Water in any of the Wells,

Which may form some excuse for the extensive and wholesale use of "John Barleycorn" and his demijohns, who are robbing the teamsters and railroad hands of all their earnings, their common sense, honesty and decency, and preparing them to board at hospital, States prison or insane asylum, at the expense of taxpayers.

Results of Whisky.

Whisky here, and at the different stations, is doing its accustomed work of degrading, and destroying every principle of honor, honesty, justice or decency, and all carried on by legalized licensed bosses. I will spare any description of the loathsome spectacles presented as evidence of their progressive work, and take it for granted that wherever men are *licensed* in this same business, they will give enough of similar results. The hopeful side of the question is found in a remark made by one at another station. He said, "As soon as we get rich and respectable, we will quit the business and move somewhere among strangers." Aside from the moral aspects of the question, there is not today anything so damaging and so thwarting to all settlements and progress in mining developments as this great curse of the nation, legalized and maintained by our high courts. Nor would I wish to be understood that only the new camps on new railroads are fully controlled by these doggery keepers, for the same is too true in every little mining camp; as soon as there is any prospect of one paying mine, at least one licensed deadfall must be planted near by. If a small smelter, or a quartz mill is built, from five to ten saloons are hastily erected. While visiting a smelter in Yavapai county, the furnace had to "be banked," *i. e.*, draw off metal fused and the slags, and remove the blast pipes, and plug up the holes, and let all remain quiet for about ten hours. Asking why, was told, "Have no ore at the furnace, the mine car broke, and the blacksmith was drunk and could not fix it, and the ore could not be put forward to the dump."

I left Ash Fork near sunset to visit the Colorado river at the Needles. Before dark we came to the "Muleshoe," where to gain an eminence they double back three or four miles, making the long narrow bend of a muleshoe, and then bringing you very near by, but above the lower end of the shoe. The scenery is grand and diversified; here well timbered, and mountains, then plains bare, or covered with small scattering small trees; water generally lacking and but few bands of sheep or cattle near the road.

The altitude of the road and the nearness to high mountains insures always a pure and healthful atmosphere.

Those desiring recreation and the enjoyment of

Grand Natural Scenery,

Combined with hunting and fishing, they can find it abundant on this route. From Ash fork to Peach springs, sixty-five miles, you descend 2,000 feet and are yet about 5,000 feet above the sea level, and if you desire to see the grand canyon of Colorado, Peach springs is the starting point. Eighteen miles drive down New river wash is a pleasant introduction to the grandeur you find when you reach the junction of Diamond River canyon one mile before its entrance into the Colorado. At this very interesting point, Young & Farlee, of Peach springs, who own the toll road and the stage line, are building a two-story house for the comfort of their visitors and passengers, who all need at least two days to do the climbing and seeing the wonders of these illustrated pages in geology—Palisade, Steeple, Cone, Haystack, Chimney, Castle or Dome—it matters not what fancy names may be applied to these monuments. They are on so grand a scale, that the name seems to be entirely lost. "I would not missed seeing that for anything," said an Ohio judge as he returned more tired than his trusty mule that had just elevated him about 2,700 feet in carrying him from the canyon to Peach springs.

The road is free from all dangerous aspects, nothing to shock the nerves with sense of impending danger. The famous springs with the peach orchard is in this canyon, four miles from the depot. They now belong to the A. and P. R. R., who have a steam engine pumping the water over the ridge into tanks for the supply of the railroad engines. The peach trees and the garden now are neglected, while their former owner has taken his $2,000 and gone to seek lands elsewhere. About 100 miles of heavy down grade on the railroad brings you to the low plane of the Colorado river, where perspiration can be had without any artificial aid, and one day will suffice to give full appreciation of the higher altitudes.

I forgot to explain to you that the rumbling thunder heard at Hackberry station, and causing some apprehensions of floods and washouts, was only the stamps of the Hackberry quartz mill about one mile off working some of their rich ore lately struck in their mines. John Howell is just naturally lucky in stopping right with a mine till it pays him the money. Some say, "he isn't so very smart, but just knows enough to hire the right kind of men to run his different works." And that little mill by the side of the railroad with so many small sacks standing around, was a small sampling mill where disinterested parties crush and sample ores, and by the assay of these samples the price of the ore is fixed and sales made.

Large Establishments

Are now being erected in good mining centers, especially in Colorado, to receive the full shipment of ores to crush, sample, and then supply dealers with samples, and receive bids on those samples and sell as advised by the owners of ore.

The mines near the railroad can ship their ores to the sampling mill, where the larger pieces are broken and all properly mixed and piled evenly, and this pile divided, and a fourth of it taken and passed through a crusher to give it a more uniform fineness, when it is piled on the floor in the same shape as was the larger pile and carefully divided, and from it another sample taken, and this passed through a finer crusher, and so on reduced, divided and sampled until a small quantity, as a sample, is reached, and this sample is then reduced to a fine powder, and bottled and marked with the number of the lot thus sampled. Buyers and sellers rely on this as the true average sample for assay value of the entire lot. In large lots this sampling process costs two dollars per ton. It seems to be the umpire between the prospect miner and the capitalist with his reduction works, and does away with all dickering in the transactions, and insures equity to both parties.

Mohave County Mines

That formerly were so inaccessible, and yet worked to profit, can now smile as they hear the locomotive scream echoed through her deep canyons and mountain cliffs. Mohave, rich in mines and in its flocks and herds could afford to wait for outside capital to come with a continental railroad through their favored lands and give them a market at their doors for their staple products—metals, meats and wool. Was pleased to see the genial face of Robert Steen, sheriff of Mohave county, who honored the same office for several years in Nye county, Nevada. I say pleased to see him, but disappointed in not being able to speak with him. He seems to be his own hired man and doing the hard work himself.

Mohave has a very small area of agricultural lands, lying mainly in the valley of Big Sandy, and a small portion on the Colorado. Her pride is in mining and stock raising—each of which enterprises is yet in its infancy—and offer, as do all the northern counties, good opportunities to the prospector for mines, or cattle ranges, and for health resorts. The altitudes, as given for the A. and P. R. R. stations, range from 4,890 feet at Peach Springs, to 6,935 feet at Flag Staff, 122 miles from the summit of the route and the great pine timber belt of the Territory. From this summit eastward 343 miles to Albuquerque, in New Mexico, the elevations vary slightly, and decline to 5,006 feet at Albuquerque. The altitude can be greatly varied within ten miles north or south of the railroad at some points. I have been more particular to mention some of these points, because I have met parties who claim to have fled from the cold Northern and Eastern States in the first stages of consumption and asthmatic troubles, and now claim to be sound and healthy, as the effect of a high, dry and mild, yet invigorating atmosphere.

This is nature's sanitarium, and all open and free to select Government or railroad lands, for all are ready for the settler. No hostile Indians within hundreds of miles.

The Only Indians

You will see on the route are near the New Mexico borders, and they are hard at work in their corn or grain fields or making hay while the sun shines. Several of these Indian families got on the cars at one of the stations at night, and no white man gives better attention to the comforts of wife and children than did these Pueblo Indians. There are immense tracts of coal fields within five miles of the road, with veins of great thickness and excellent quality.

The Petrified Forest,

Of miles in extent and well timbered with crystallized trees giving the finest specimens for the lapidary of precious opals and the various named gems, and often the hollow center of the tree is fully set with glittering quartz of various colors. One of our fellow travelers who had visited Mammoth cave, Niagara, and the great sights of the world, said this impressed him as grand beyond any other, and considered it worth the trip. He chided the idea of going across the Atlantic ocean when greater wonders are to be found here right at home, and made now so easily accessible even to the aged and the invalid. This whole Territory north and south is a land of antiquity, filled with wonders and mysteries, and abounding in vast treasures, inviting capital, energy, science and mechanical skill to successfully develop these resources and plant here the broad principles of American institutions. The present aspect is favorable and progress is sure and onward.

B. W. CROWELL.

Albuquerque, N. M., Aug. 15, 1883.

What Bodie District Produced.

Below is given the bullion shipments made by four of the companies operating in this district during the first six months of 1883. There has been considerable gold dust sent out by private parties of which there is no record. The figures given show up well and indicate that our mines are not yet exhausted, as many people imagine. There is a good field yet to be explored in this district, and when the mining industry emerges from under the cloud that seems to hover over it and depress it, still better results may be looked for. The Syndicate mill was closed from January 1st to April 1st:

STANDARD CON.

1883.	Gold.	Silver.	Total.
January	$5,499.03	$13,904.52	$99,403.55
February	107,347.28	14,466.10	121,813.38
March	75,899.10	9,311.52	85,210.62
April	97,939.10	14,796.16	112,735.26
May	98,984.98	12,671.36	171,656.34
June	98,416.03	13,956.95	112,372.98
Total			$643,192.13

BODIE CON.

1883.	Gold.	Silver.	Total.
January	$10,980.43	$15,088.42	$26,077.85
February	9,577.62	16,712.53	26,290.15
March	7,754.69	13,705.69	21,460.38
April	9,692.86	15,395.04	25,087.90
May	13,277.51	18,902.44	32,179.95
June	7,996.53	10,188.09	18,184.62
Total	$59,288.64	$89,992.21	$149,280.85

SYNDICATE.

	Gold.	Silver.	Total.
January	$8,562.58	$864.70	$9,217.39
April	4,552.95	315.97	4,868.92
May	5,589.82	393.52	5,987.34
June	8,416.15	626.35	9,042.50
July	8,683.96	615.72	9,299.68
Total			$38,415.83

BODIE TUNNEL.

January	$9,644.95
February	10,471.19
March	12,249.43
April	10,467.64
May	6,714.31
June	3,194.71
Total	$52,742.23

The grand total foots up $83,631.04. The Bodie Tunnel Co. made only two shipments during June, the mill closing down before the end of the month. The shipments of the Standard mine during July amounted to $95,208.24. In the Syndicate statement the shipment for July is included.—*Bodie Free Press.*

ENCOURAGEMENT FOR OUR COPPER MINERS. It may encourage our owners of copper mines to know that the Calumet and Hecla copper mine, on the south side of Lake Superior, yields but four and one-half per cent of metal. The copper mines of Sweden are worked at a profit, notwithstanding the ore yields but one or one and one-half per cent, and a little silver, while the Newfoundland copper mines, which are considered very valuable, yield (according to the return of sales at Swansea) only six and one-quarter per cent. Our copper prospectors would hardly take a second look at even the best of the ores mentioned above. What they want are ores that show from thirty to sixty per cent.—*Enterprise.*

MECHANICAL PROGRESS.

Some Unobserved Phases of Electrical Progress.

The attention of the general public has been drawn of late years to the subject of electricity through the attraction of the dazzling electric light. Of the progress made during this period in other and perhaps more important applications of the science to the useful arts but little is known, since such matters rarely find their way into the popular literature of the day.

We refer here principally to the advances made in the application of electricity to chemistry, metallurgy and galvano-plating, which, though less attractive than the application of the science to illumination, are collectively of much more industrial importance. In the field of electro-chemistry, for example, eminent chemists and electricians have buised themselves in testing the theoretical views and opinions of their predecessors, have demonstrated the correctness of some of them; have modified others; and in some cases have advanced new theories.

The method of analysis by electrolysis, which until lately was but rarely employed in the laboratory, has, by reason of the discovery and systematic development of a number of new and reliable methods of determination and separation, not only become a valuable aid to the chemist in analytical work, but has become of the highest importance to the metallurgist.

The analysis of certain minerals and metallurgical products, which, until the origination and improvment of the electrolytic methods of separation, had been a procedure of great difficulty, is now readily accomplished, with rapidity and certainty, with their aid.

In metallurgy, the production on the large scale of metals, in a state of extraordinary purity with the aid of the electrical current, is now an accomplished fact, and the method is now firmly established as a technical and commercial success. Its eminent practical value is shown by the introduction of the electrolytic process in some of the most extensive metallurgical establishments.

In close connection with the application of the electrical current to metallurgical work, the utilization of the heat of the voltaic arc for the smelting and working of metals deserves to be mentioned. In this direction, the electrical smelting furnace of Siemens—a device that has attracted profound attention in scientific circles—suggests the possibility that within a few years the metal worker may have placed at his disposal a source of intense heat, which may prove of enormous value.

Again, the separation of metals from particles of mingled iron, and the purification and concentration of ores of iron, by electrical means, has come to be quite a useful and important operation.

Galvanoplasty, or the art of producing metallic deposits upon objects of metal, etc., for artistic or useful purposes, has of late years been enriched by a long series of new and improved methods, which have had the result of elevating its practice from the stage of empiricism to the rank of a recognized branch of applied science, based upon accurate scientific methods. The role which the dynamo-electric machine—by which mechanical energy is directly converted into electrical current—has played, in developing and extending this important branch of electrical technology, we have elsewhere pointed out. It has contributed more than any other cause to the immense extension of the art of electro-plating in all its branches; it has called nickel plating into existence; and by greatly cheapening the cost of a multitude of artistic and useful objects, has placed within the reach of those of slender means, even, the possession of beautiful and serviceable wares of great variety which are not distinguishable in elegance of appearance from the most costly articles which are of necessity the exclusive property of the rich.

In addition to these notable evidences of progress, we might enumerate a large number of new and interesting inventions and discoveries, extending the application of electricity to the most diverse branches of industry, and these are being extended day by day. It is true that many of these will probably not stand the crucial test of practical application, but this fact does not detract from the strength of the assertion that the most valuable applications of electricity to the industries are those which are only brought indirectly to the knowledge of the general public.—*Manufacturer and Builder.*

Concerning Belts.

The *Trade Review* has collated a few useful hints as to belts, from various but recent sources. A new belt needs to be "bedded down" to the pulley before it can do effective work. A riveted belt takes longer to do this than those which have the plies cemented or sewed together. Increasing the width of the belt is generally a benefit, especially when the tension is heavy. When a belt commences to get full of animal oil and dirt it loses its efficiency. For slipping belts various remedies are proposed. Printers' ink gives temporary relief, but creates glaze. Coal tar and flour have been recommended for exposed belts running close over water. For rubber belting, whiting, applied as a dry powder, is good. Oiling with castor oil, to make pliable, is highly recommended for leather belts; but neatsfoot oil should never be used, nor should oil in any form be used on rubber belts. The best plan, both for the preservation of belts and the protection of life and limb, is to box them. Among the elements that enter into belt depreciation are, length, width, thickness, strain, friction or power to transmit tension, proper adjustment, temperature, manner of joining and moisture. Oak tanned belts last one-third longer than those chemically tanned. Running the belt on too tight a pulley will generate heat, decompose the oil and organic matter in the belt, and hasten its decay. Vertical belts are the most difficult to manage. Short driving belts depreciate more rapidly than any others. It is estimated that such belts need renewal every 10 or 12 years, and that for flouring mills the depreciation is 10 per cent; for iron workers, 12½ per cent; and for wood workers, 20 per cent. An experienced engineer says he has made a belt last him 10 years, by each Saturday evening turning the inner side out, washing it well with warm water and soda, scraping and oiling it, and then going over the same operation Monday morning before starting the machinery. By doing this and keeping his pulleys clean, he finds that they will run at full speed with five pounds of steam when the belts are on loose pulleys, while a larger engine alongside, to which no such attention is given, cannot run with less than 38 pounds under like conditions.

New forms of belts are constantly appearing. Hair belts are in use in Germany, but their cheapness over leather belts is doubted. A new method of manufacture, applicable to rubber, woven tissues, or gutta percha, consists in making the belt with longitudinal ribs or grooves, to increase its strength and prevent stretching and variations. Still another is to groove one side of the belt the same as saw teeth, then to put these two pieces together, thus obviating warping.

Mechanical Progress, as Shown at the Paris Exhibition in 1878.

The report of M. Hirsh, Secretary of the jury in charge of the department of machinery at the late Universal Exhibition at Paris, has just been made public, and though too much time has elapsed to make it probable that it will be of any material service, save for comparative reference in the future, some of the views that he advances are worth noting and reproducing. The paragraphs quoted below, from *Science*, relate to his summary of results:

"One remarkable feature of the exhibition was the absence of valueless and eccentric devices. * * * In studying progress it is noted that the gain is considerable in every direction. In the production of steam, the more general use of heaters of the feed-water is observable; the use of tubular and of the safety forms of boilers is increasing; superheating is oftener practiced; better material and workmanship are seen.

"In steam engine practice, the use of higher steam of greater expansion, the adoption of two types exclusively—the compound of the Wolff type and the American forms of single cylinder engines—greater speed of piston and rotation, the use of better material and workmanship, are the characteristics of recent practice. Rotary engines are given up. Air and gas engines are extensively used, but only for small powers. Among the hydraulic motors, the turbines are principally used, and have attained great perfection in practice as in theory. Aerostation has made no great progress, notwithstanding the interest it continually awakens.

"American exhibitors distinguish themselves by the boldness and ingenuity of their designs, and by their entire independence of tradition. Their devices are adapted precisely and effectively to their work."

The following quotation from M. Hirsh's work summarizes briefly his opinion of the American method of design and construction: "*Les Americains s'attachaient avec energie a l'idee primiere, a l'idee juste; ils l'amelioraient, la perfectionnaient, et meme au prix des grandes complications de mechanisme, ils finissaient par la faire triompher, et par l'imposer de nouveau a l'Europe.*" The English of which quite complimentary allusion to our mechanical methods is, liberally rendered, as follows: "The Americans aim directly at the object to be reached; they improve, they perfect, and, even at the cost of great complication of mechanism, they end by triumphing, and by forcing Europe to accept their results."

WIRE DRAWING.—It was not until some time after 1300 that wire-drawing became an art. A race of wire-drawers, who made iron wire by hand and afterwards by water power, then sprang up in Germany and became famous in Europe. Wire-making was introduced in England about the middle of the fifteenth century. This industry was commenced in the United States at the beginning of the present century, and it is needless to say that it has grown to enormous proportions within the past few years.

A POINT ABOUT BLACKSMITHS' FIRES.—A common trouble in country blacksmith shops is the going out of the fire while the smith is doing work away from it. This annoyance can be prevented by keeping at hand a box containing sawdust. When the fire seems to be out, throw a handful of sawdust on the coals and a good blaze will quickly follow. This may seem a small matter, but there are many who will find my suggestion a useful one.—*Blacksmith and Wheelwright.*

SCIENTIFIC PROGRESS.

Effect of Alcohol upon Digestion.

It cannot be claimed that we have yet learned all that is to be known about our stomachs and the reactions that take place within them, notwithstanding the fact that one man, at least, lived for many years with an *open window*, as it were, in his stomach.

Every contribution to our knowledge of the subject based on real, first hand, experimental proof, has some value, hence we think that the recent experiments of Dr. P. J. Spenzer upon the effect of wine on the medical properties of pepsin are worthy of careful and thoughtful attention, imperfect as they are.

Pepsin, also known as chimosin, is one of the active ferments of digestion. For medicinal purposes it is prepared by scraping the well washed stomach of a hog, and in this state possesses the property of dissolving a large quantity of coagulated albumen, such as the white of egg. Dr. Spenzer, in his paper read before the Ohio State Pharmaceutical Association, gives the amount of white of egg (hard boiled) that will be dissolved by one grain of the pure pepsin, of different makers, when mixed with eight drops of pure concentrated hydrochloric acid in six hours. The amount varied from 68 to 170 grains, with an average of about 80 grains.

He found that the acid alone would dissolve half as much as the acid and pepsin, or 40 grains, and that eight drops of acid and 100 c. c. of ten per cent alcohol would dissolve as much albumen as the ordinary commercial pepsin and acid would together. This would make alcohol equal to pepsin as a digestive agent for egg albumen. For raw beef the case is quite different; acid and alcohol having less power than acid alone, while acid and milk sugar dissolved as much meat as the best pepsin with acid.

It is to be regretted that alcohol was not tried in combination with pepsin.

In conclusion, Dr. Spenzer states his conviction that an hour's exercise in the fresh air is equal in digestive power to any usual dose of pepsin, regardless of maker. When commercial pepsin is used it should be as fresh as possible.

H. Seeman has proved that free hydrochloric exists in the stomach, although the presence of peptones prevents its detection by means of methyl violet. This is probably one reason why it has so long been an unsettled question whether it was hydrochloric or lactic acid that gave the acidity to the gastric juice.—*Scientific American.*

Centrifugal Force.

Professors Ayrton and Perry exhibited at a recent meeting of the Physical Society an ingenious lecture apparatus for demonstrating the laws of centrifugal force. As was properly pointed out by Professor Ayrton, the ordinary lecture apparatus of this kind do not really demonstrate the laws of the subject, but simply show the effect; and a new and more scientific class of apparatus is demanded by the extension of scientific teaching. Professor Perry and he had been engaged in designing new apparatus to meet the wants of their City Guilds students, and the apparatus shown was one of the instruments in question. It consists of a rotating vertical axis carrying an aneroid chamber filled with mercury, which also rises in a graduated capillary tube projecting from its middle. A metal arm projects at right angles from the aneroid or diaphragm side of this chamber, and carries a sliding weight which can be shifted to different distances on the graduated arm. On rotating the axis the centrifugal force of the projecting arm pulls on the elastic diaphragm of the mercury chamber, and the mercury within it having more room sinks in the capillary tube by a corresponding number of degrees. The apparatus is capable of demonstrating the law of centrifugal force with accuracy, according to experiments which have been made; and, as Professor Guthrie remarked, it could be used for indicating the speed of wheels and shafts. We may add that there is already a mercury counter in existence, in which a closed mercury chamber is rotated, and the parabolic concavity given to the mercury by the centrifugal force is employed to measure the speed.—*Scientific American.*

NEW AND STALE BREAD.—A celebrated French chemist, M. Boussingault, has recently been engaged investigating the nature of the change which takes place when bread becomes stale, something which has hitherto not been understood. In the course of his experiments a circular loaf, twelve inches in diameter and six inches thick, was taken from an oven heated 240° Reaumur, and a thermometer forced into it three inches. The themometer indicated 78° R. (207.5 F.) The loaf was then taken to a room, the temperature of which was 66° F., and temperature of loaf sunk to 73° F. and in twenty-four hours to 66°, and in thirty-six hours to 63.5°. In the first forty-eight hours it lost only two ounces in weight. After six days the loaf was again put in the oven, and when the thermometer had indicated its temperature had risen to 156° F, it was cut open and found to be fresh, and to possess the same qualities as if it had been taken out of the oven the first time; but it had lost twelve ounces in weight. Experiments were made with slices of bread with similar results, proving conclusively that new bread differs from the old, not by containing a large proportion of water, but by a peculiar molecular condition. This commences and continues to change during cooling, but by again heating the bread to a certain temperature, it is restored to its original state. It is the mechanical state which makes new bread less digestible than old. The former is soft, elastic and glutinous in all its parts, and ordinary mastigation fails to reduce it to a sufficiently digestible condition.

EXPLOSION OF CARBONIC ACID.—L. Pfaundler placed a sealed glass tube, which was about two-thirds full of liquid carbonic acid in a bath of carbonic acid and ether, which had been reduced to a temperature below 100° (−148° F.), in order to obtain crystallized carbonic acid. Beautiful, transparent, strongly refracting crystals soon appeared, which completely filled the submerged portion of the tube, while a layer of fluid carbonic acid floated over them. After a few minutes the upper end of the tube, which was exposed to the air, suddenly exploded with a loud report. The same tube had previously been often exposed to a temperature of more than 31° (55.8° F.) It is possible that the glass, at this low temperature, became so brittle that it could not bear the steam pressure of the still fluid portion of the carbonic acid and the influence of the temperature of the air. But it seems more likely that the solid carbonic acid burst the tube in consequence of its thermal expansion. *Ann. der Phys. und Chem.*

THE auditory nerve, divided into some three thousand harp-strings, is incapable of receiving impressions from finer vibrations than those pertaining to sound. The delicate organism of the inner ear may be injured so that ordinary audition is impossible; yet, if the little harp be intact, the proper rates of vibration may be communicated to and received by it through other nerves which lie in the immediate neighborhood. A deaf person may often be made to hear the twanging of a stretched cord or wire, one extremity of which is held in the teeth. The sound is communicated through the bones of the head to the inner ear. The audiphone held to the face or any fleshy part of the person will give no result, and it is valueless to those whose teeth are "marvels of art." Nor will the audiphone accept the lower jaw as even passing good substitute, for the mechanical separation of this from the head bones interposes at the joint an imperfect conductor.

VIBRATORY sensation is capable of development. Practice in the microscopist gives him a power of vision which the uninitiated little dreams of. The piano tuner will discover an inharmonious element in a musical chord, which to another would be utterly unappreciable. The tea taster will detect a shade of flavor or value between samples which to the uneducated would be precisely similar. The physician readily recognizes the odors of diseases, in some instances, when these are sufficiently concentrated, but when the vibratory antagonism of the molecules of these have separated them until there is no more than the highest homœopathic attenuation in the atmosphere, there may still remain sufficient of both quantity and intensity to reproduce the parent disease.

EFFECT OF PRESSURE ON THE MELTING POINT OF ICE.—The experiment of Bottomley, which apparently illustrates the fact that increased pressure lowers the freezing point of water, is well-known. A wire weighted at both ends is thrown over a cake of ice and cuts through it. The ice melts beneath the wire and freezes above it. Professor Guthrie, at a meeting of the Physical Society held in London, April 28, 1883, gives his reasons for believing that the wire conducts heat to the ice from the atmosphere and that the experiment does not illustrate the well-known fact that increased pressure lowers the freezing point. A silk wire, weighted to the same amount as a metallic wire will not cut through a block of ice.

LAND CULTIVATION OF SEA WEEDS.—London papers say that "the secretary to the Royal Botanic Society recently tried the novel experiment of planting sea weeds in ordinary earth. It would naturally be supposed that these 'flowers of the ocean' would not flourish away from their native element; but this is not the case, most of the specimens planted having grown admirably in soil which is constantly kept in a moist condition." The result is both curious and suggestive, and worthy of trial this side of the ocean.

STARCH FROM SUGAR.—Everyone knows nowadays that we can make sugar (one kind at least) out of starch; but as yet we are no more able to reverse the operation than we are to combine carbonic acid with water or alcohol to make sugar. Bohm's experiments go to show that in the plant both operations take place, viz: making sugar from carbonic acid and the conversion of this sugar into starch, the chlorophyl grannles being the agent that aids in this change under sunlight.

PROF. VOGLER considers that a part of the duty of observers at meteorological stations should be to ascertain the quantity of oxygen in the air from time to time, as he believes that the percentage of it varies, or is intimately connected with barometric changes.

MINING SHAREHOLDERS' DIRECTORY.

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ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELIN'ST.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Alpha Con M Co	Nevada	14	50	July 17	Aug 20	Sept 8	A W Havens	309 Montgomery st
Belle Con M Co	California	3	50	Aug 4	Sept 10	Oct 10	G W Sessons	309 Montgomery st
Challar M Co	Nevada	12	1.00	Aug 2	Sept 6	Sept 28	W E Dean	309 Montgomery st
Con Virginia M Co	Nevada	19	20	July 11	Aug 15	Sept 5	A W Havens	309 Montgomery st
California M Co	Nevada	8	20	June 26	Aug 4	Sept 3	C P Gordon	309 Montgomery st
East Mt Diablo M Co	Nevada	3	05	Aug 13	Sept 17	Oct 8	G W Fisher	306 Pine st
Eureka Con M Co	Nevada	5	1.00	July 26	Aug 27	Sept 17	P Jacobus	309 Montgomery st
Justice M Co	Nevada	39	10	July 9	Aug 13	Sept 3	R E Kelly	419 California st
Mexican M Co	Nevada	23	50	July 17	Aug 22	Sept 11	C L McCoy	309 Montgomery st
North Gould & Curry M Co	Nevada	5	25	Aug 9	Sept 11	Oct 1	C H Mason	309 Montgomery st
Ophir M Co	Nevada	45	1.00	July 28	Aug 31	Sept 20	C L McCoy	309 Montgomery st
Potosi M Co	Nevada	13	50	Aug 13	Sept 17	Oct 8	W K Dean	309 Montgomery st
Savage M Co	Nevada	56	50	July 19	Aug 21	Sept 10	E B Holmes	309 Montgomery st
Sierra Nevada M Co	Nevada	7	77	Aug 9	Sept 12	Oct 2	E L Parker	309 Montgomery st
Tip Top M Co	Arizona	7	25	Aug 16	Sept 24	Oct 22	H Deas	309 Montgomery st
Union Con M Co	Nevada	23	50	July 17	Aug 20	Sept 11	J M Buffington	309 California st
Utah S M Co	Nevada	45	1.00	July 20	Aug 27	Sept 14	G C Pratt	309 Montgomery st
Virginia Con M Co	California	10	01	July 24	Sept 3	Sept 24	A F Benard	364 Howard st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Alaska M Co	California	3	1 00	Aug 22	Sept 24	Oct 13	A Judson	320 Sansome st
Campo Seco Copper Co	California	2	10	Aug 10	Oct 1	Nov 20	D Buck	309 Montgomery st
Como Eureka G and S M Co	Nevada	1	25	July 23	Aug 29	Sept 18	L Hermann	220 Sansome st
Excelsior Water and M Co	California	5	60	July 6	Sept 15	Oct 6	W J Stewart	215 Sansome st
Equitable M Co	Utah	28	25	July 24	Aug 31	Sept 28	C J Collins	512 Montgomery st
Golden Fleece Gravel M Co	California	3	50	Aug 1	Sept 5	Sept 22	F Schirmeier	785 Folsom st
Gorilla M & M Co	California	2	21	Aug 23	Oct 3	Oct 31	A A Enquist	436 Montgomery st
Hazard Gravel M Co	California	7	14	June 20	Aug 16	Sept 4	T McGeoghegan	318 Pine st
Homeward-bound M Co	California	2	25	July 23	Aug 27	Sept 10	A S Bowie	314 Montgomery st
Homer M & M Co	California	3	10	Aug 2	Sept 8	Oct 2	F E Luty	330 Pine st
Linn Con M Co	Arizona	4	05	Aug 6	Sept 10	Oct 6	R D Hopkins	436 Montgomery st
Pittsburg M Co	California	16	10	July 24	Aug 28	Sept 18	R Wegener	414 California st
Swansea M Co	California	3	25	July 21	Sept 1	Sept 24	M A Wheeler	119 Market st
Sutton G M Co	California	3	8	July 31	Sept 5	Sept 27	A Martin	525 California st
West Branch Feather River M Co	Cal	1	01	July 16	Aug 20	Sept 10	A B Paul	328 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Alaska M Co		A Judson	320 Sansome st	Annual	Sept 4
Arnold M Co		A Judson	320 Sansome st	Annual	Sept 4
Ashenda M Co	California	T H Dixon	238 Montgomery st	Annual	Sept 5
Albion Con M Co	Nevada	A W Havens	309 Montgomery st	Annual	Sept 6
Bodie Tunnel Co	California	C D Harvey	309 Montgomery st	Annual	Sept 18
Booker Con M Co	California	G W Sessions	309 Montgomery st	Annual	Sept 4
Liberty Hill Con M Co	California	F E Luty	330 Pine st	Annual	Sept 6
Northern Belle M Co	Nevada	W Willis	309 Montgomery st	Annual	Sept 10
Pioneer M Co		A Judson	320 Sansome st	Annual	Sept 18
Pedro Con M Co		J Stadtfeld, Jr	419 California st	Annual	Sept 5
Real del Castello M Co		A Judson	320 Sansome st	Annual	Sept 4
San Pedro M Co		H Deas	309 Montgomery st	Annual	Sept 3
Villagrana M Co		A Judson	320 Sansome st	Annual	Sept 4

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Bulwer Con M Co	California	W Willis	309 Montgomery st	15	July 2
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	July 13
Mt Diablo M Co	Nevada	R W Heath	318 Pine st	25	Aug 23
Navajo M Co	Nevada	J W Pew	310 Pine st	25	May 14
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	Aug 12
Silver King M Co	Arizona	J Nash	315 California st	25	July 12

Table of Highest and Lowest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Aug. 8.		WEEK ENDING Aug. 15.		WEEK ENDING Aug. 22.		WEEK ENDING Aug. 29.	
Alpha	1.70	2 30	2.00	2.50	2.00	2.40	....	2 10
Alta	.70	1.10	1.00	1.15	.60	1.05	.80	1.10
Andes	.65	.90	....	.75	.70	.85	.70	.75
Albion	....	.35	....	.05	....	.50	....	....
Argenta	.15	.25	....	....	.25	.55	.20	.30
Atlas	....	....	....	....	....	....	....	....
Belcher	1.00	1.20	1.05	1.20	1.00	1.05	1.00	1.05
Belding	....	....	....	....	....	....	....	....
Best & Belcher	4.25	4.80	4.10	4.60	4.10	4.50	4.20	4.50
Bullion	.90	1.28	1.10	1.25	1.10	1 20	1.00	1.10
Bechtel	....	....	....	....	....	....	....	....
Belle Isle	....	.40	....	.40	.35	.40	....	.25
Bodie Con	.35	.45	.35	.40	....	.25	.15	.25
Benton	.20	.25	.20	.25	.15	.20	.20	.25
Bodie Tunnel	....	....	....	....	....	....	....	....
Caledonia	....	.25	.20	.25	.20	.25	....	....
California	.40	.50	.40	.45	.30	.40	.30	.40
Challenge	.30	.40	....	....	....	....	....	....
Chollar	3.00	3.25	3.20	3.60	3.10	3.30	2.70	3.20
Confidence	2.00	2 25	....	2.20	2.05	2.25	....	.35
Con. Imperial	....	.10	....	....	....	....	....	....
Con. Virginia	.35	.50	.40	.70	.55	.65	.65	.75
Crown Point	1.00	1.25	1.20	1.25	1.00	1.20	....	1.15
Day	....	.60	....	....	....	....	....	....
Elko Con	....	....	....	....	....	....	....	....
Eureka Con	5¼	6.00	5.50	6.25	6.00	6.25	6.75	7.25
Eureka Tunnel	....	.40	....	....	....	....	....	....
Exchequer	.45	.60	.60	.75	.55	.75	.60	.65
Grand Prize	....	....	....	....	....	.30	....	.25
Gould & Curry	3.00	3.70	3.15	3.65	2.85	3 35	3.10	3.25
Hale & Norcross	6.00	6.75	6¼	6¾	6.30	6.25	5¾	6¼
Holmes	....	....	....	....	....	....	....	....
Independence	....	....	....	....	.50	55	....	....
Julia	....	....	....	....	....	.15	.05	.10
Justice	.20	.25	.30	.35	.30	.35	.30	.40
Jackson	....	....	....	....	....	....	....	.50
Kentuck	....	....	....	....	....	....	....	....
Martin White	....	.30	....	.25	....	....	....	....
Mono	....	....	....	....	....	....	....	....
Mexican	3.35	4.10	3.20	3.75	3 35	3.80	3.65	3.85
Mt. Diablo	....	5.00	....	....	6.25	6.50	4.15	4.25
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	....	....	....	....	....	....	....	....
Northern Belle	....	6.75	....	6.50	6¼	6¾	....	6¼
North Noonday	....	....	....	....	....	....	....	....
Navajo	3.10	3.25	....	3.15	2.60	3.20	2 95	3.00
North Belle Isle	....	.40	....	.40	....	.40	....	....
Occidental	....	1.80	....	1.70	....	....	....	....
Ophir	3.85	4.20	3.50	4.15	3.05	3.95	3.05	4.00
Overman	.35	.50	....	.40	.40	.45	....	....
Oro	....	....	....	....	....	....	....	....
Potosi	1.25	1.35	1.20	1.40	1.15	1.30	1.05	1 20
Pinal Con	....	....	....	....	....	....	....	....
Savage	2.05	2.25	2.05	2.40	1.85	2.55	2.40	2.60
Sag. Belcher	....	3.00	....	....	....	....	....	....
Sierra Nevada	4.20	6¼	4.35	4.70	4.25	4.70	3.75	4.30
Silver Hill	....	....	....	.10	....	.10	....	.10
Silver King	....	....	3.90	6.50	6.50	7.00	7.00	8.00
Scorpion	.70	.85	.60	.70	.55	.65	.60	.65
Tuscarora	....	....	....	....	....	....	....	....
Union Con	4.85	6.50	5.00	5.75	5¼	6.25	5¼	5¾
Utah	2.50	3.35	2.50	2.95	2.60	3.20	2.90	3.20
Ward	....	....	....	....	....	....	....	....
Wiles	....	....	....	....	....	....	....	....
Yellow Jacket	2.95	3.65	3.30	3.55	3.05	3.55	3.05	3.25

Sales at San Francisco Stock Exchange

THURSDAY A. M., Aug. 30.

100	Alta	1.10@	1 15
300	Andes	.70c	
120	Argenta	.10@15c	
200	B & Belcher	4.05@	4.10
100	Belcher	1 05	
100	Belle Isle	30c	
150	Benton Con	20c	
50	Bodie Con	.15c	
850	Chollar	2@	2 10
800	Con. Virginia	.60c	
800	California	30c	
150	Con. Imperial	.05c	
100	Confidence	2.05	
95	Eureka Con	.6¼	
600	Gould & Curry	2.95@	3
1040	Hale & Nor	4.40@	4¼
100	Julia	.10c	
100	Justice	.35c	
180	Mexican	3.60	
15	Mt. Diablo	4.20	
50	Navajo	2.90	
75	Northern Belle	.6¾	
150	Ophir	5.55	
490	Potosi	.90@	95c
500	Savage	2.10@	2.15
480	Sierra Nevada	3.70@	3.75
940	Solid Silver	20@	25c
150	Utah	2.95@	3
1065	Union	5¼	

AFTERNOON SESSION.

100	Belle Isle	30c	
4180	Alta	4 05@	4.15
50	Andes	75c	
50	Belmont	90c	
100	Bodie Con	15c	
50	B. & Belcher	4.20	
360	Chollar	2.80@	2 85
500	Con. Virginia	65c	
200	Gould & Curry	3.15@	3.20
1600	Hale & Nor	5@	5¼
465	Mexican	32@	3.90
100	Navajo	2.95	
300	N. Belle Is	50c	
200	Ophir	3.95@	4
50	Potosi	1.10	
200	Savage	2.45	
370	Sierra Nevada	4@	4.05
10	Silver King	8	
280	Union Con	5¾	
50	Yellow Jacket	3.05	

Mining Share Market.

There is not much of interest to chronicle in connection with the mining share market. Little activity has been shown or no developments of any exciting kind have occurred for some time in any of the mines called on the Board. On the Comstock the present points of interest at the north end are the south drift in the Union Con., and the joint Sierra Nevada winze below the 3000 level. The Sierra Nevada folks have not yet gone into the north drift, left at their south line by the Union Con. Co., for the reason that the supply of air is insufficient for three gangs of miners. This drift and that south in Union ground being on the same line makes square work north and south. The drift will be extended a proper distance into the Sierra ground before a crosscut is made. They are making good headway in the Ophir in opening out on the 150 level in the old ground. At Gold Hill some ore is still being extracted by the Yellow Jacket, and considerable work is being done in the way of exploration; but at the Crown Point and Belcher not much can be done until the mills on the Carson river are able to resume crushing to their full capacity.

Bullion Shipments.

Ontario, Aug. 21, $8,727; Alice, 23d, $11,138; Ontario, 23d, $4,595; Horn Silver, 23d, $12,000; Ontario, 25th, $4,568; Horn Silver, 25th, $12,000; Stormont, 26th, $2,620; Hanauer, 26th, $3,850; Ontario, 26th, $4,410; Horn Silver, 26th, $12,000; Alice, 28th, $11,176; Hanauer, 28th, $7,200; Crescent, 28th, $8,365. During the week ending August 25th, inclusive, there were shipped from Salt Lake 43 cars of bullion, 1,086,750 pounds, sent East; 21 cars of ore, 440,000 lbs., sent to Colorado, and one car white lead, 22,500 lbs., sent East, making a grand total of 65 cars, aggregating 1,549,070 lbs. Mt. Diablo, 28th, $21,634; Tombstone, for July, $83,000; Mt. Diablo, 23d, $6,568; Bodie, 27th, $7,073; Standard, 27th, $13,663; Northern Belle, 27th, $3,647.

THE production of copper in 1882 was 91,646,232 pounds, worth, at an average of 17½ cents per pound in New York, $16,038,091. For the first half of 1883 the production is estimated at 58,000,000 pounds, worth, at an average in New York of 14.65 per pound, $8,500,000. The spot value of copper at the point of production is a matter which cannot be stated with any accuracy, nor was any attempt made to ascertain the number of tons of copper ore mined. In 1882, 3,325,000 pounds of blnestone, worth $191,187, were made; and in the first half of 1883 the manufacture of bluestone is estimated at 1,662,500 pounds, worth $95,593.

THE Salt Lake *Tribune* hears that arrangements are being entered into with local smelters to have the ore from the Bullion, Beck and Champion mines, in Tintie district, melted in this valley, instead of shipping it out of the Territory as ore. There are over 100,000 tons of ore to work up.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned

CALIFORNIA.

Amador.

BLUE GRAVEL.—Amador *Dispatch*, Aug. 25: This claim is about nine miles above Sutter Creek, on the Wise toll road, and has indications of being one of the richest and most extensive gravel discoveries ever made in the county. The claim embraces about 40 acres, every portion of which prospects well from the surface to the bedrock, about 12 ft. The mine has a most favorable location, being a part of a basin or flat some 200 ft below the summit of the ridge and on which a large reservoir has been constructed. They will have plenty of free water for several months

MAMMOTH.—*Ledger*, Aug. 25: A contract has been let to run the remaining 400 ft of the upper tunnel, to strike the shaft. The contractor is an Austrian; the price is $3.50 per ft. The last contract was for $3.75 per ft.

REPORTED STRIKE.—Reports are in circulation of an important strike at Amador City. In the South Spring Hill claim, in running a crosscut, a ledge 4 ft wide was cut. The rock, it is said, shows plentifully in free gold.

THE MIDDLE BAR TUNNEL.—The work of starting the big tunnel at Middle Bar was inaugurated Wednesday afternoon. The water supply, however, was found to be inadequate. There is some defect in the laying of the pipe. This may take a day or two to remedy. The contract has not yet been let, although parties stand ready to take it at $10.25 per foot. In a few days this huge undertaking will be in full blast.

MISCELLANEOUS.—The Morgan claims at Murphy's gulch are still idle, and it is not likely that work will be resumed for several days yet. The Plymouth Con. M. Co. declared its third dividend on the 9th instant, of 50 cents per share, amounting to $50,000. The Oneida mill is at work on rock from the Jackson mine. The Kennedy mill is running on ore from the St. Louis claim near by.

AMADOR CON.—Sinking at the Amador Con. still progresses. I am informed that only 50 ft more remains to be sunk before drifting will be in order. It is said that good ore has been struck in the shaft.

Calaveras.

WEST POINT.—Cor. of *Chronicle*, Aug. 25: The main shaft of the Scorpion mine is down to the depth of 100 ft, with the finest kind of prospects. No. 2 shaft of the same mine is down about 90 ft. They are sinking an air shaft, which will enable them to get at a rich body of ore which heretofore they have been unable to get at on account of foul air. In the Star of the West the prospects are encouraging. They are still sinking on very rich rock, and are down to the depth of 230 ft. The machinery and building, formerly of the Carlton, is now being put up on the Henry mine. The main shaft of this mine is down 100 ft. On the Wide West mine Mr. Sterling has erected a large water wheel for hoisting and pumping, and has commenced sinking on a 4 ft ledge. The Ohio Con. mine is situated between the south and middle fork of the Mokelumne river, and has the largest ledge that has ever been developed in this section of the country. It is cut 18 ft wide at the south end of the ledge, and a tunnel run into it 81 ft; the ore will mill from $35 to $45 per ton. At the north end they have run a tunnel on the vein, which is 5 ft in width, and the ore will mill from $500 to $1,000 per ton. There is rock enough in sight now to run two 50-stamp mills for the next 20 years. We hear that it is the intention to erect two 50-stamp mills, one on each fork of the river.

Fresno.

MT. RAYMOND.—*Expositor*, Aug. 22: S. L. Hogue has recently returned from Fresno Flats. He reports times very lively. He says the Mt. Raymond silver mines are attracting much attention, and he predicts that there will be as big an excitement over them as there was over Bodie and Mammoth a few years ago. He says that Dr. Ball and Robert Harlow showed him specimens that assayed over $200 per ton in silver.

A MOUNTAIN OF SILVER.—The Mariposa *Herald* of 24th inst., says of Mt. Raymond, in a dispatch of late date: Mr. Smart, Constable of Fresno Flats, was in Mariposa Saturday. He said that every man in Fresno Flat had gone to Mt. Raymond. We left on horseback for the Flats. We proceeded to interview the mine owners. Every man we talked to was interested in a claim, and not one of them was worth—in his mind—less than a million dollars. Mt. Raymond for 4 miles was represented as a solid mass of silver ore, that assayed from $100 to $150 per ton, all smelting rock and easy to mine. Seventy locations had been made and a new mining recorder elected. From 50 to 75 prospectors were on the ground and hundreds on the way. One saloon had been started and a boarding-house would be opened in a few days. Old prospectors and good miners asserted that the famous Comstock was a prospect-hole in comparison, and that next year the biggest mining camp ever seen on this coast would be at Mt. Raymond. Several claims had been bonded by the agents of Senator Sharon and George Hearst.

Mono.

STANDARD CON.—Bodie *Free Press*, Aug. 21: During the week there was extracted and shipped to the mill 1,116 tons of ore; crude bullion received 2,480 ounces. The east crosscut 1200 level was advanced 14 ft; total length 48 ft. North drift No. 1, 1000 level, was run 12 ft; total length 291 ft. The vein is 2 ft wide.

BODIE CON.—During the week ending the 18th there was 144.085 tons of ore hauled to the mill and 145.275 tons crushed. The average assay value of the pulp was $40.01 per ton; that of the tailings was $6.36.

BODIE TUNNEL.—The west crosscut on the 250 level was advanced 13 ft during the past week. The south drift on the 200 level was extended 10 ft. The ledge looks well, and higher assays are being obtained.

BULWER CON.—The west crosscut from the north drift, 500 level, is in 409 ft; progress 13 ft, in hard ground. The south drift from west crosscut No. 1, 500 level, is in 221 ft, showing a vein 2 ft wide.

Nevada.

MAGENTA CON.—Grass Valley *Union*, Aug. 22: Arrangements have been made to put up hoisting and pumping works on the Magenta Con. mine, and the work of placing the steam machinery will soon be commenced. The machinery will be set up over the old shaft, which is down 350 ft. The Magenta adjoins the Empire mine on the same lead.

BULLDOZER.—Tri-weekly *Herald*, Aug. 25: J. C. Locklin is engaged in prospecting the Bulldozer mine on Deer creek, opposite Worrel's ranch. Mr. Locklin has an overshot water wheel supplied with water from the creek and conducted to the wheel by a ditch, 2,000 ft long. This wheel furnishes pumping and hoisting power. Already 15 tons have been taken out and crushed with satisfactory results.

San Bernardino.

LAVA BEDS.—Cor. Calico *Print*, Aug. 25: The Morning Star Co. are working their complement of men. The various openings and other workings are showing up, without exception, bodies of high grade silver ore. I am informed that in a few days a shipment will be made. An assay office is in coarse of construction. The Sampson mine, which joins the Morning Star on the east, is being opened up with a small force of men; in the two openings made exceedingly rich ore is being extracted, giving promise of large deposits as depth is attained. The Meteor is owned by the Morning Star Co., and is looking well, carrying the same character of ore as that in the other mines. The Mammoth Chief, owned by the Clark Bros., is a splendid property. The Clark Bros. also own the Desert Queen which adjoins on the west. The Lizzie and Rattler are on the north of the Morning Star and show great promise, as also does the Glittering Star. The Wide West is being opened by Mr. Oakes and Jack Pascoe. They have a fine prospect. The above mentioned claims are all that have any work done upon them at this writing. Many other valuable claims will be opened this fall that will add to the general prosperity of the camp.

Shasta.

BULLY CHOOP.—Cor. of Anderson *Enterprise*, Aug. 25: The west tunnel on the Cumberland is in 195 ft. They will have to run twenty ft further to strike the supposed crossing of the Mammoth and Occidental ledges, when rich developments are expected. The Bully Choop shaft is down about 60 feet. I understand it is the intention to sink to a level with their lower tunnel and then form a junction. Mr. Thompson of the Caucasian, is taking out ore which he intends to have crushed. The Davis Bros. expect to resume work on the Pound Cake in a few days.

FURNACEVILLE.—Cor. of *Courier*, Aug. 25: The Afterthought will close down about the first of next month. Mr. Stewart, the Supt., is a man that will see that everything is right. He has the mine so well opened, that he is satisfied that it will pay well if sufficient ore can be worked. No work has been done in the mine for several days, but the chances are favorable that mining will be resumed soon, to continue all winter. There is a large quantity of wood at the mill, and all other necessary material to start with at once.

DEADWOOD.—*Democrat*, Aug. 22: We are informed that Frank Ballou has struck a quartz ledge in the Deadwood district that prospects $100 to the ton. The ledge is twelve inches wide and well defined. Dent Young has struck more rich quartz on Spring creek, from which he pounded out $20 in a mortar one day last week.

Sierra.

RUBY MINE.—Downieville *Messenger*, Aug. 25: The Ruby M. Co. discharged a number of men last week because the channel, 110 ft above the main tunnel, seemed to have been cut off both on the north and south by a deep channel filled with mountain lava. This deep channel has been known ever since the company ran the main tunnel, but no sustained effort has been made to prospect it. Later they started a tunnel 30 ft from the bottom of the main tunnel and pushed it eastward until they cut the rim. Down this rim has been sunk incline No. 2. Last Monday gravel was struck in this incline, and a good prospect obtained, one piece weighing $5. The prospects are now very flattering. This deep channel is undoubtedly the old Rock Creek channel. * * Since the above was written we learn that the incline is down 4 ft below the bottom of the main tunnel, the bedrock still pitching 1 ft in 3. It is a splendid bed of free gravel about 6 ft thick and getting thicker and coarser as it goes down, with a good prospect in gold. Supt. Jennings has started the main tunnel for it. Its being below the tunnel is of no great moment, as a few hundred feet north will bring the bedrock up. Our information comes from one who has had 30 years' experience, and who says: "In my judgment it is by far the best layout for a paying mine that the Ruby has ever had."

SUNNYSIDE.—The Sunnyside Co. have commenced work on their claim, having built a cabin about 400 ft up the ravine above the breakout on the Kimball ditch, where several thousand dollars were taken out years ago from a small spot.

Trinity

EAST FORK.—*Journal*, Aug. 25: James Moor tells us that Day, Moor & Co. have their arastra on East Fork completed; that they are now engaged in digging a ditch which will probably be completed within two weeks—that there is plenty of water in the creek for working purposes; and that they will be crushing rock from their rich ledge before many days.

STILL IMPROVING.—We learn that the Blakemore ledge, in Eastman district, which has been rich from the croppings down, has been found richer than ever during the past week.

QUICKSILVER.—Louis Girard, who has had charge of the retorts at Altoona, running on ore from Fred. Loring's mine, informs us that 32 flasks were produced.

Tuolumne

PATTERSON MINE.—Sonora *Democrat*, Aug. 25: This mine has been in steady operation, with a 20-stamp mill for many months with results so satisfactory that the owners are making some costly improvements. A new six inch pump, run by a Knight's wheel is being placed in position in the shaft. The shaft is down 620 ft, and is an incline, which gives a perpendicular depth of over 500 ft. This pump will handle all the water at a depth of 1,000 ft, to which depth it is intended to sink the shaft. The new machinery will be ready for operation by the first week in September. In the meantime the mill is undergoing some necessary repairs. When new levels are run, and the mine thoroughly opened, it is proposed to add twenty more stamps.

GREEN MINE.—The Green Mine presents an active scene; the mill is constantly crushing, while the

mine is being opened deeper. W. A. Clark, one of the owners, came down Tuesday with the result of the last crushing, which was a handsome amount of retorted gold.

DIVOLI.—The Divoli Bonanza mine, under the supervision of Capt. Colby, is prospecting immensely, a large body of rich milling ore being extracted.

NEVADA.

Washoe District.

SIERRA NEVADA.—*Enterprise*, Aug. 25: The north drift on the 2000 level is progressing at the rate of 30 ft per week. On the 3000 level the north drift of the Union Con. has reached the Sierra Nevada line, but has not yet been extended as the supply of air is not sufficient. The joint Union Con. winze below the 3000 level is being sunk at the rate of 13 ft per week.

GOULD AND CURRY.—Good progress is making in east crosscut No. 2, on the 2500 level. It is in a vein of a favorable character. The pump at the Osbiston shaft is running at about eight strokes per minute.

UNION CON.—The north drift on the 3000 level has been carried up to the south line of the Sierra Nevada, and a south drift has been started in the belt of porphyry between the 30-ft and the 7-ft ore veins. The joint Sierra Nevada winze below the 300 level is being sunk at the rate of 13 ft per week.

IMPERIAL.—The work of overhauling the gallows frame at the Imperial hoisting works was commenced yesterday. It is intended to explore and mine the old upper levels of this mine, the Alpha and Exchequer.

HALE AND NORCROSS.—Although the winze below the 2600 level was drained a day or two since, but little has been done in the bottom owing to stoppages at the Combination shaft.

BEST AND BELCHER.—The drifts on the 2500 level are very wet, and it is found necessary to make frequent stoppages to allow the ground to drain out. The wet section lying between this mine and the Con. Virginia is, however, being steadily narrowed.

OPHIR.—West drifts Nos. 1 and 2, on the 150 level, are passing into ground of a promising appearance. The ore taken from the croppings is being sent down to the tunnel level through the old Mexican shaft.

YELLOW JACKET.—A large amount of ore has been opened up, but the quantity that can be reduced at present is limited, owing to the low stage of water in the Carson river.

MEXICAN.—Very fair progress is made in the raise going up from the 2900 level, though the rock is exceedingly hard. The north drift on the 3100 level is making rapid progress, in a favorable formation.

CON. VIRGINIA.—The south drift on the 2700 level is making fair progress.

UTAH.—Are making good headway in the north lateral drift on the 1350 level.

ANDES.—Some low grade ore is being encountered and of late considerable bodies of fine-looking quartz.

SCORPION.—The west drift on the 500 level continues in favorable material.

SAVAGE.—Nothing is being done on the 2600 level, but a start will be made soon.

CALIFORNIA.—At the joint Con. Virginia drift are taking up and conducting the water to the 2800 tank.

CHOLLAR.—Crosscutting will not be resumed until the new hydraulic pump has gone into operation.

ALTA.—Pumping water will be the regular business at this mine for three or four months.

UNION SHAFT.—Are easing timbers at the 2300 station.

Esmeralda District.

LOST INDIAN.—*Herald*, Aug. 25: A three foot vein of very fine looking gold and silver bearing quartz was cut last week. Umpstead & Latipe, are confident that the Lost Indian is a bonanza. Five tons of ore, now on the dump, will average $100 per ton. These gentlemen also own the Central mine, situated near the Lost Indian. A cut has been run tapping the vein at a depth of 20 ft, and has uncovered a four-ft ledge of $20 ore. In Powell Creek canyon, near Tom Stevens', they have a claim known as the New Discovery, from the croppings of which assays have been made, giving the flattering returns of from $200 to $700 per ton.

PERMELIA.—Nine miles south of Benton is the Permelia mine, one of the greatest gold ledges in Mono county. A shaft sunk on the ledge at the depth of 200 ft shows a body of good ore 20 ft in width. The assays from the mine average $75 per ton and upwards.

Pioche District.

THE DAY MINE.—Pioche *Record*, Aug. 18: The Day mine is in better shape than for a long time. It has been thoroughly put in order; the tunnels and drifts have all been cleaned out. The ore bodies have been drifted into and ore can now be extracted with little trouble.

COMET.—This district is coming to the front. There came to Poujade's ore-buying establishment, since our last issue, four lots of ore. They sampled 270, 302, 208 and 544 ounces, or in dollars assay value $336, $390, $268 and $703 per ton. All these came from Comet district, the richest being from the East Redemption mine, worked by Burrows & Glover.

BOWERY.—Pete Williams is extracting high grade ore in the Bowery mine. He is of the opinion that he has found the ledge that was lost years ago. He struck the ore at the side of the shaft.

Paradise District.

WILD GOOSE.—Winnemucca *Silver State*, Aug. 20: Yesterday a bar of bullion of the assay value of $2,832.51 was received at Wells, Fargo & Co.'s office here from the Paradise Valley mill. It was the first bar produced under the new management, and the ore which produced it was from the Wild Goose mine.

Tuscarora District.

ARGENTA.—*Times-Review*, Aug. 23: North crosscut, 400-foot level, extended 15 ft; total length, 30 ft. Ground continues very hard.

NORTH BELLE ISLE.—In the south drift, 300 level, the formation has been favorable and the drift advanced rapidly.

GRAND PRIZE.—West drift, 300 level, extended 20 ft, south drift extended 11 ft. South drift, 400 level, extended 10 ft.

ELKO CON. Fair progress has been made in sinking shaft No. 2. Present depth 91 ft, made the past week 12 ft. The streak of quartz shows great improvement. Hoisting machinery in perfect order and running smoothly.

BELLE ISLE. No. 1 drift north, 350 level, has been advanced 29 ft, and further progress for the present suspended and an upraise started at this point. No. 2 drift extended 12 ft. On the 450 level the north drift has been extended 8 ft. Vein continues strong.

NAVAJO. During the past week all the heavy parts of the compressor have been put in place, and it will now soon be in running order. All other work in and about the mine, is being pushed ahead rapidly.

ARIZONA.

MONARCH OF THE SEA.—Pinal *Drill*, Aug. 18: We visited the double shaft, from which they are taking fine ore. It is solidly timbered all the way. Thence we visited the tunnel which we explored candle in hand, also the drifts; it was 275 ft deep, showing metal all the way. The parties interested in this mine spare no expense. From the northern extremity of the King to their mine, about a mile, they were building a fine, level road. At the time, they were employing all the men they could get.

BLUE BIRD.—This property, in the Martinez canyon, is developing finely. The vein is capped with quartz showing galena. They have in a 20-ft crosscut a 12 ft seam of quartz carrying gray carbonate and galena. The walls are well defined and 12 ft apart. They have drifted 12 ft of solid ore in the vein.

AUSTRALIA.—Work is going on in the shaft. Good ore is found all the way and has been hauled to the Queen Creek smelter.

MOUNT VIEW.—On the Mount View the ore is being sorted for transportation to the mill.

NACOOCHA.—On this mine work is still going on, in a shaft. They continue to obtain fine ore, galena with silver. They employ three men.

SILVER KING.—At the mine and mill the work goes on as usual.

RICH ORE.—Prescott *Miner*, Aug. 18: Mr. Craigue, superintendent of the Dosoris mine, yesterday stated that he had about eight inches of ore at the end of his 700 ft tunnel. This ore is worth $3,000 to $6,000 per ton. Nineteen men are at work in the mine and Mr. Craigue will soon ship a carload of rich ore to New York. Other gentlemen who visited the mine were dazzled with its exhibition of silver. Rich ore has been found in several extensions on the Pine Spring. United Verde Copper Co.'s smelter is running successfully. Messrs. Vanderbilt and Burton are sinking in the King Kelly mine, Groom Creek district.

HOWELL REDUCTION WORKS. Prescott *Courier*, Aug. 14: The Howell works are making a splendid record. Gentlemen who arrived last evening tell us that 100,000 pounds of bullion were yesterday loaded on teams, which are now on the road to the A. P. railroad. Twenty tons more are at the smelter, awaiting transportation. Smelter and mill are kept going night and day. Pack trains are constantly employed, bringing rich silver ore from the company's Blue Dick mine.

It is reported that Mr. Chase has struck it rich in one of his Turkey creek mines.

ARIZONA AT THE DENVER EXPOSITION.—Tombstone *Epitaph*, Aug. 14: Tombstone district makes a handsome display. There are more mines represented in this district than in any other in the Territory. The Contention mine has a fine line of porphyritic gold and silver hearing specimens. This mine has paid the owners $2,762,500 in dividends within the last four years, and is holding up to its usual output. The Grand Central mine has some fine specimens on exhibit, which are much like those of the Contention. The Grand Central has paid over $900,000 in dividends and keeps up to her usual output of 85 tons daily. This property is valued at $7,000,000. The Tombstone M. Co. are well represented by specimens from their mines, among which is a very fine one of telluride of gold and silver, which averages $4,000 per ton. This company has paid $1,850,000 in dividends.

COLORADO.

INMAN.—Mining *Gazette*, Aug. 18: The Inman lode was discovered in May by Scott Griswold. It is close to Chicago Creek in Jackson district. It is a well defined fissure vein carrying from four to nine inches of decomposed quartz at grass roots which assayed here gave silver 465 ozs., copper, 4.5 per cent. Total value, $518.25. This is without doubt the greatest find ever made on Chicago Creek and will be hard to beat in the State. The vein is not less than six feet between walls in any place exposed.

NOTES.—Assays made this week from mineralized quartz out of the Silver Bullion lode, ran $497.20, $155.50 and $33 per ton. Doyle and Howkins, from Bullion Camp, on Saturday were exhibiting fine specimens of silver from that camp. Six inches of solid mineral-carrying galena, gray copper, and green carbonate of copper have come in on the hanging wall of the Rochester lode, Spring Gulch. Work is progressing day and night on the Silver Ring lode, Cascade district. Some very fine iron carrying large quantities of free gold is being taken out at a depth of twenty ft in the shaft of the Old Squaw lode, Spring Gulch. Two ft of solid ore that will mill $100 per ton can be seen on the hanging wall of the Rio Grande lode, Spring Gulch. The contractors have reached a depth of 97 ft in the shaft. Some very high mineral has been struck in the Sheldon, Cascade district. A twelve ton lot of ore from the Pay Rock mine at Georgetown, last week gave returns in silver per ton: first-class, 975 ounces; second-class, 417 ounces; third class, 146 ounces. Eight tons of surface quartz shipped to the Mott Concentrating and Sampling Works from the Lexington group, Squirrel Gulch, gave 7 oz., 3 cwt., 3 gr. of gold worth twenty dollars per oz. Mr. John Ward cleaned up 20 oz. gold from his placer last week, the result of two eight hour shifts of four men.

SILVER MOON AND BOBTAIL.—Correspondent of Denver *Tribune*, Aug. 15: In most instances property in Williams Fork is yet in first hands. It has never had a boom; the aid of capital has not been invoked, and yet development has gone on. Of the new strikes the most prominent are those of the Silver Moon and the Bobtail. The first is developed by a crosscut 175 ft in length, at which point the foot wall of the Silver Moon lode was cut, and hugging it close, from six to eight inches of high grade sulphuret and galena ore, bright and native silver. The owners are now cutting through to reach the hanging walls and the indications are good for a second streak. From a doubtful experiment, the Silver Moon has in the last day or two become a pay mine. It is owned by Denver and St. Louis parties. The Bobtail, the wonder of the camp, has added to its fame a two-inch streak of ruby silver ore. The La Plata is working in very rich ore, while the Ready Cash, with daily shipments of ore, is proving a bigger bonanza with each day's development.

GUNNISON ORE SAMPLING CO.—The machinery and laboratory appliances are now on the road from Chicago. The works will be in running order by the 20th of this month. The exact site of the mill is not yet fully determined on, but will either be in Pitkin or at Quartz, three miles from Pitkin. Quartz is the present shipping point of the Tin Cup mines. The daily production of the Pitkin and Tin Cup districts combined is about seventy tons and will ere long reach one hundred and fifty tons.

MONTEZUMA.—Georgetown *Miner*, Aug. 18: Supt. Buckland has three teams hauling to the new Brittle Silver mill from the St. Elmo tunnel, where he claims to have two ft of ore in the Mark Twain and three ft in a lode recently struck, which he says runs ninety ounces. On the Herman shaft, Ed. Guihor has six ft of ore. The Wild Irishman, an extension, has a rather small streak, which nets $69 per ton over all expenses. The Silver Prince, another extension, does nearly as well.

INDEPENDENCE.—The Independence mine, on McClellan mountain, East Argentine district, is under lease to J. B. Johnson, who has twelve men at work, on ore that averages from 100 to 125 ounces silver to the ton and 50 per cent lead. Mr. Johnson had four tons milled on the third that returned 316 ounces silver and $4 in gold to the ton.

IDAHO.

ELKHORN MINE, Ketchum *Keystone*, Aug. 15: The pocket of ore recently noted in the *Keystone* as the largest ever encountered in the Elkhorn mine, was about the average grade of ore heretofore extracted. Since, a connected stope on the vein 20 ft from top to bottom, is marked by a beautiful ledge of galena and carbonates containing a distinct vein of clear block galena, four ft wide throughout, remarkable in returning an assay value from several samples of 175 ounces per ton. This is 75 ounces more than the average of the galena heretofore, and is indeed of unusual rarity in lead mines.

SNAKE RIVER PLACERS.—Butte *Miner*, Aug. 18: An Eagle Rock correspondent of the Salt Lake *Tribune*, says: The gravel bars on Snake river are becoming valuable. There is not a claim within five miles of Eagle Rock that is not staked off. Scarcity of water is a great drawback. The Snake River Water Co. is furnishing all the water now used. This company can supply water for 30 miles in length, but except where the gravel banks are tributary to the canal, the gravel is, for the present, unworkable. One man with plenty of water can wash out half an acre during the season. He can wash out $12 every day, at a low estimate. This makes about $4,000 gold that can be saved in every acre of these gravel beds. How many acres are there? There will be gold enough washed out and saved in the next ten years, from the Snake river gravel beds, to pay the national debt twice over!

THE PHILADELPHIA SMELTER.—Wood River *Times*, Aug. 15: Since May 25, the Philadelphia Smelting Co. have shipped 96 full carloads of bullion to Omaha, and sent out four more loaded to-day, making 100 carloads, which is valued at $325,000. In future there will be 40 tons of base bullion shipped from the works to the railroad every day.

SILVER FORTUNE.—Professor Thompson, who last spring visited Wood River with Supt. Taft, of Galena, recently took a bond on the Silver Fortune mine, owned by Jack Reid and partner, and located on the East Fork of Wood river, near the iron mines. A shaft sunk 30 ft on the vein exposed a solid body of high grade galena ore three ft wide. The price in the bond is $30,000.

RICH STRIKE.—Joseph M. Taylor, the lucky prospector who discovered the Davitt, and other valuable mines, has just made a strike in the Albion claim, located on the head of Lee's gulch. He has uncovered for 7 ft an 18 inch vein of solid ore which assays in the hundreds of ounces in silver, and several parties are skirmishing for a bond on it.

MAYFLOWER.—Supt. Havens arrived yesterday from Silver City. The vein on the Mayflower is 60 ft wide at the end of the lower tunnel, 900 ft in from the mouth. Burleigh drills will be used to chamber out the ore. The Mayflower has twice the amount of pay ore shown up at the time the mine was paid for. It was purchased for $375,000.

HECLA.—Burgess and others, who own the Hecla mine on Copper canyon, are having ore extracted which runs 180 ounces in silver to the ton. At the end of the tunnel, 242 ft in the mountain, the vein averages four ft. They have on the adjoining ground an incline shaft 40 ft deep, and a foot of solid galena in the bottom which assays 160 ounces in silver.

MONTANA.

ANACONDA.—Cor. *New Northwest*, Aug. 17: An order was lately received to increase the capacity of the smelter from 300 to 500 tons per day, and the two massive stone walls nearly completed have therefore been built each 1,000 ft long instead of 750 as at first commenced. On the left are two other stone walls built and terraces above are being blasted out of the solid granite for the concentrator. Lumber and bricks are being delivered and the boss carpenter is expected daily. The prospects are they will get the building well under way before winter sets in. About 80 houses are in various stages of construction, including seven hotels and boarding houses, twelve saloons, and six stores.

HELENA.—*Independent*, Aug. 17: An important business transaction was the recent purchase of the Alta Montana Co.'s mines and reduction works by the Helena Mining and Reduction Company. The furnaces at Wickes will be used for the present where they are. At the foot of the Alta hill, two miles south from the old works, where there is plenty of water, a new concentrator of 150 tons daily capacity, is building, and the concentrator at the Comet mine is to be enlarged to double its present capacity. Within four months from this date a railroad will be in operation between the works and the main line of the Northern Pacific at Helena. These improvements involve the expenditure of nearly a half million dollars. Enlargement is also the order at the Gregory Con. works. Their old concentrator is to be torn down and a new one erected having a capacity of 75 tons per day. It will be equipped with two of the largest crushers and four of the largest rolls made and will have two compartments. The Ætna Iron Foundry, of San Francisco, has contracted to complete the concentrator and have it in running order within three months from date. The mine is reported as making the best showing ever known in its history. For 400 ft along the sixth level, the galena is continuous. The 60-stamp mill of the Boston and Montana's Gloster mine has been shut down for about a week, and a contract has been made with the Union Iron Works to put in 24 pans and 12 settlers, besides 48 settling tanks. Another boiler will be added, making four and a 200-horse power engine will be added, which will make an aggregate of 300-horse power.

NOTES, Butte *Miner*, Aug. 15: Sixty-four bars of bullion were shipped last week, valued at $93,100. The Alice is credited with $53,904; Lexington $18,224, and Donnell, Clark & Larabie, $23,032. At this rate of bullion production the Alice will soon resume the payment of dividends. At the Moulton the air connection from the 300 southwest drift has been completed and the winze is now 60 ft deep with 2 ft of 100 ounce ore in the bottom. W. A. Clark has commenced operations on his purchase, the Neptune. Barker & Caldwell are working the Neptune No. 2, south of the Moulton. At a depth of 42 ft a ledge of ore 45 ft wide has been struck, which is believed to be the south fork of the great Rainbow lode. Baker & Sarchet have been developing a new claim called the Swansea, situated east of the Colusa. At the bottom of a 100 ft shaft a ledge 25 ft wide sampled 16% copper and 80 ounces silver. The Stemple mine is a promising prospect, leased by Hammer & Connor, who are getting out rock which assays from 20 to 200 ounces. The Pollack work under a lease by the Clark Brothers is looking splendid. A tunnel has been run in 25 ft from the east side of the hill striking a 2½ ft ledge, from which the first-class rock mills 120 ounces and the second 72 ounces. Frank Cary and Mike Sullivan are working the Amy Silversmith center lead. They have sunk a shaft 30 ft deep and are in good ore. A sample from the dump yesterday sampled 100 ounces.

NEW MEXICO.

NOTES.—Kingston *Tribune*, Aug. 16: Placer gold has been discovered near Albuquerque. The Hardscrabble mine in Socorro county, has been sold for $125,000. Ten tons of ore shipped from Bremen's '76 mine, Silver City, N. M., to Pueblo, averaged $800 per ton. A $10 gold nugget was washed out in Baxter gulch the other day, by Dr. St. Charles. The Midnight mine, Magdalena mountains, has a wide vein carrying ore that runs from 30 to 40 ounces in silver and a good deal in gold. A carload of ore shipped from the mines of the Solid Silver Co., at Bullard's Peak, Golden, Col., netted between $7,000 to $8,000.

PACIFIC NO. 2.—*Southwest Sentinel*, Aug. 15: The ore from Pacific No. 2, now on exhibition at the store of Neff, Bell & Stevens, demonstrates that Pinos Altos is far from being a played out camp. The specimens (about a hat full) are more than half wire gold. They are from a pocket which was struck in the mine, three weeks since, and from which fully 200 pounds of wire gold ore was taken. The ore on all sides of this pocket was very rich, running into the hundreds, and in all about 15 tons were taken out. The Pacific No. 2 is owned and worked by Wm. Skillicorn.

FLEMING.—*Southwest Sentinel*, Aug. 18: The Old Man mine looks better than ever. Southwest from the shaft a working tunnel has been started, and is in ore already. At present the company have 400 sacks of ore awaiting shipment, and on the dumps there are upwards of 1,500 tons of milling ore, having a value ranging from $50 to $100 per ton, which will be reserved until such time as the company will have completed their mill now in contemplation.

OREGON.

GORDON.—Bedrock *Democrat*, Aug. 15: The old quartz mill is running steadily. A. J. Lawrence is at the helm, but he is ably assisted by John Bulger and John Griffin, old mining experts. The rock that is being worked is taken from the new discovery on the Gordon, and rumor says, is extremely rich.

UTAH.

COMET.—Salt Lake *Tribune*, Aug. 21: The value of ore from the Comet mine, Copper gulch, has been demonstrated by sending a carload to Colorado for treatment. After paying the cost of hauling to Frisco, loading on cars, transportation to Colorado, commissions, etc., it netted to the owners over $60 per ton. For a single test of one carload, this did well, and when the company get their own reduction works they expect to get still better returns. They are putting in hoisting works. Drifts are being run on the vein, crosscutting is being done, and general development work is going on satisfactorily.

MARYSVALE.—Cor. of Salt Lake *Tribune*, Aug. 17: At last the mining boom has struck Sevier county, and this time in the shape of an immense deposit of copper ore. I say immense from the fact that its full dimensions have not as yet been made out. Enough, however, has been uncovered to show a breadth of over 100 ft, and as yet no hanging or foot walls. A tunnel of about 35 ft has been run in to crosscut it, and all is in solid ore. The ore seems to consist of ruby, black and red oxides, and ranges in assays from 15% to 45% copper, with a perceptible amount of gold. Considerable excitement was known to exist in certain mining circles at the Vale, but as the find was kept secret from all but a few, it was not generally known until within the past few days. It is in Sevier county, about six miles from Monroe, and only a short distance from the Sevier river. A new district has been formed, and is known as the Henry district, and the mine as the D. A. Giles copper mine.

A Case in Point.

[Written for the PRESS by C. H. AARON.]

It is constantly asserted by the promoters and inventors of new metallurgical processes and machinery, as a *raison d'etre* of their schemes, that there is urgent need of improvement in our methods of treating more especially the ores or matrices of the precious metals. That there is at least room for such improvement will not be denied, and it may perhaps be said that, within the last fifteen or twenty years, more progress has been made in the metallurgy of copper, lead, iron and steel than in that of gold and silver. In iron and steel especially some radical changes have been made with very important results. In copper we have new styles of smelters, new leading processes and the successful application of the Bessemere process to mattes, as well as of electrolysis to the refining of black copper producing therefrom a malleable metal of a high degree of purity with great economy. In lead also new methods of smelting and refining have been introduced, but, except in so far as improvements in the working of lead and copper have indirectly affected the metallurgy of gold and silver in the direction of argentiferous and auriferous smelting ores and mattes, but little has been done, comparatively, toward perfecting the extraction of the precious metals, of which the losses in fumes and tailings are still about as large as they were twenty years ago, although some advance has been made in point of economy by means of labor saving contrivances.

What is here meant is not to disparage the various excellent crushers, pulverizers, concentrators and amalgamators that have had their birth within the period named, but that no radically new process has been developed. The writer was recently called on to treat a silver ore, of which the composition was roughly as follows: Quartz, calrite, iron and manganese, oxides and probably carbonates, lead molybdate, silver chloride, and silver in unrecognized forms of combination; also a very little copper carbonate. The ore was practically free from sulphur, arsenic or antimony.

This ore was considered to be "free milling," and was so to the extent of the contained silver chloride, which was easily reduced in pans with salt and quicksilver, or extracted by lixiviation with sodium hyposulphite. But this included only from seventy to eighty per cent of the total siver contained; the remainder was in other combinations, and was practically beyond the reach of any known process of extraction. The large proportion of calcite present forbade the use of bluestone, copperas, or acids in conjunction with the salt, it being found by experiment that more than five per cent of strong sulphuric acid, or fifty per cent of copperas, was neutralized or decomposed in a very short time, leaving the silver compounds unaffected

Copper dichloride dissolved in hot brine being compatible with the presence of calcite, and being a powerful reagent for the conversion of many silver compounds into chloride, held out a hope of better results, but on trial it also was found to be speedily decomposed, the copper in solution being replaced by manganese. This is not the first time that this reaction has been observed, and, from the fact that the manganese remains in solution, it appears that calcite has no power to decompose the soluble salt of that metal which is formed. On the other hand, large quantities, even up to twenty per cent of copperas or bluestone, added to the pulp in the pans, left after a short time no trace of any soluble metal, salt giving a precipitate with sodium sulphide.

Disregarding theoretical considerations, all the usual "chemicals," including bluestone, copperas, acids, cyanide of potassium, sodium, amalgam, ashes, etc., were tried in succession, and so far as they were compatible, jointly without benefit; also grinding and not grinding in the pans. The only thing which was of any avail was the addition to each charge of a few pounds of precipitated copper, which acted as an auxiliary in rapid reduction of the silver chloride, thus increasing the working capacity of the pans by lessening the time during which it was necessary to work the pulp.

We were led to this use of cement copper by the following observed facts. The first work done on this ore yielded bullion .830 fine, and left no soluble silver in the tailings, yet the liquid filtered from the tailings showed no iron in solution, although bluestone was used in the working. The second bar was .996 fine; the tailings gave higher assays, and a little silver could be extracted from the tailings by leaching with hypo. The third bar was .999 fine; in fact, the assay, corrected by a check, indicated 1,000 fine, and the tailings showed an increased proportion of soluble silver. It was ascertained that the use of bluestone neither improved the yield nor contaminated the bullion by reduction of copper, whence it was evident that the copper in the first bar was not derived from the bluestone used, nor was the better result attained to be ascribed to that, although apparently due to the presence of metallic copper.

It was thus remembered that the pans had previously been used in working roasted ore containing copper, and yielding bullion only about .700 fine, and no doubt all the quicksilver not retorted contained copper, while the pans, notwithstanding a "clean-up," were lined more or less with coppery amalgam. This suggested the use of precipitated copper in the working, which proved effectual, the tailings retaining no soluble silver worth notice, and the bullion being reduced to .996 fine. No doubt equally close work could have been done, and pure silver produced by allowing a longer time for working. But all this did not affect the main question. That portion of the silver which existed in forms other than that of chloride remained in the tailings, and as the ore was too poor for roasting, under the prevailing conditions, we were forced to content ourselves with the extraction of 70 to 80 per cent of its value. No doubt this ore could be worked with satisfactory result if circumstances had permitted of its being brought into conjunction with smelting ores of a complementary character, and it is now some years since the writer endeavored to direct public attention to the great advantages to be thus gained by the establishment of metallurgical centers, with cheap transportation; but this was not possible, and the consequence was that an ore containing $35 to $40 per ton (assay value) in silver, could be made to pay but very little more than the expenses of mining, hauling and milling.

This is but one of many such cases, so that even if smelting works with the command of a variety of ores for mixing were practically accessible, it would be impossible for them to dispose of the large quantities of low grade dry ores which could be produced. Concentration was tried with this ore, but, as was expected, it was found that while the horn silver could be saved very well, the portion which eluded amalgamation also escaped concentration to a great extent, by passing off with the slimes, while that which remained inclosed in the heavy sand was not rendered more amenable to treatment. What is needed for such ores is a radically new process which will extract cheaply 95 or 98 per cent of the silver from any existing natural combination. Here is a chance for somebody to "revolutionize" the metallurgy of low grade silver ores to his own profit and glory, and to the great benefit (?) of the world.

Shipping Ores from Utah.

"What does the hauling of ores from Utah to Kansas City and Denver mean?" asked a Salt Lake *Tribune* reporter of one of the prominent smelters.

"Nothing material, I guess."

"But is it cheaper to haul the ores out than to haul in the coke and haul out the product?"

"No, not that I know of, but it is a question of rates. If the roads will haul ores to Pueblo for $5 a ton, and it takes two tons of high grade lead ore to make one ton of bullion and they charge $18 a ton to haul the bullion that far east, there is clearly an advantage in hauling out the ores, leaving out of view the hauling in of fuel. But they can't haul ores from here to Pueblo for $5 a ton without losing money."

"Isn't the Union Pacific hauling ores from Park City to Denver cheaper than they will to Salt Lake?"

"No, they are not. The whole thing is a spurt, and for what purpose I don't know. They have taken out of here a few hundred tons of siliceous ores that they were willing to give more for in Kansas City and Colorado than we are. Kansas City got enough of it, it is said, with one lot, and at a certain smelter in Colorado there are 2,000 tons of the same kind of Utah ores now lying in the yard."

"But isn't there something threatening to our smelting interests in the consolidation of the Grant smelter and the Omaha smelter, the two largest ore-reducing concerns in the country, with railroad men, as it is said, interested in them?"

"Maybe, but probably not. Omaha has not bought any Utah ores for two years, and the inference is that it wouldn't pay. I don't think either road will find it a paying business in the long run to haul ores over the mountains at a loss."

"But is it, for a fact, cheaper to haul the ores to Denver or Omaha than to haul out the coke and haul back the bullion?"

"It depends on circumstances and conditions so completely that I cannot answer offhand. But if it is, it is curious that it has not been discovered before. It is mainly a question of rates, as I said before, although railroads cannot permanently fix rates against facts; that is, against economic conditions. We have lately doubled our smelting capacity, and we did it without a tremor. I have no idea that the smelting of half the continent can be concentrated at Denver, or Omaha, or anywhere else. There is a little disturbance at present, but it is not likely to last a great while, I think."

INDIAN RECORDS.—The Plumas *National* says: "A mile or so from the celebrated Four Hills mine, near Eureka, is a very large cropping of iron ore, which belongs to the Mohawk company, and in one place the ore, nearly pure, crops out some thirty feet high. It is soft and easily cut, and from appearances has been used for many generations by the Indians as a record book of passing events, and a means of communication. It is covered with rude pictures of animals—deer, bear, etc.—and now and then men and dogs figure extensively in the 'map.' Hieroglyphics which are, of course, unintelligible, cover large portions of the croppings, and mixed with these can be found names of prospectors who left their mark twenty years or more ago. It is an interesting place, and our informant says, it is well worth a trip up there to see it." In Meadow Lake District, Nevada county, California, there is a place where there are on the rocks many curious pictures and hieroglyphics.

Ore at Great Depth in Eureka District.

More than three years ago the machinery on the old shaft of the Eureka Con. proved unable to handle the water which came in on the 1400 level—the lowest depth which had been attained. The indications were, when the miners were driven out by the water, that there was ore in quantity and quality to prospect for, and that if the trouble from water could be overcome there would be found a mine as extensive and valuable, if not more extensive and valuable, below than had been developed above. It was determined by the bold and sagacious managers of the company's affairs that a problem was presented which they could solve, having the conditions given. Solved already in their minds as definitely as any problem in mines can be solved, they resolved to test their judgment by explorations. They made up their minds to prove what they believed to be true, that the ore in the Eureka Con. extends below the water level; that the mine is permanent and contains ore bodies which make down to an indefinite depth.

The Locan Shaft.

The new shaft, named Locan after the genial and shrewd President of the company, was projected and work started over three years ago. At least $700,000 was spent in erecting large hoisting works and putting up immense hydraulic machinery. The most of the expense was paid out of surplus money in the company's treasury, reserved for the purpose, two recent assessments having been collected to aid in the enterprise, there being a third assessment levied but not yet collected. The Locan shaft, in order to gain in depth, was started considerably below the old shaft. Neither the splendid history of the mine nor the details of this latter enterprise need now be recounted. They are familiar to all who pay any attention to mining affairs, not only here, but throughout the commercial world. At the new works the shaft was sunk to a depth of 1,200 feet. Drifting towards where it was calculated the ledge would be found was begun. Progress was reported at short intervals. Our people were on tiptoe awaiting the result.

Pro and Con.

Should the calculations of the Eureka Con. directors prove incorrect and no ore be found in the drift, everybody was ready to be disappointed and put on the best face possible. Then it would have to be admitted as probable, though not altogether proved, that the Ruby Hill mines would have to be honey-combed to a few hundred feet below the surface and deserted; that such time is near at hand, for it cannot be denied that, though there is considerable virgin ground in the Eureka Con. and Richmond, the principal mines on the Hill, from the surface to, say 1,200 feet below, the best of the ore deposits have been pretty well taken out. Should these mines turn out shallow, and the experiment in the Eureka Con. prove a failure, we would have to depend upon numerous smaller mines, worked from the grass roots to a depth of only several hundred feet; unless in the distant future another veritable bonanza should be found and encourage its lucky owners to try another such experiment.

On the other hand, should the explorations in the Locan shaft bring out what its projectors calculated—should ore be found in the drift from the 1200—the mine itself would be proved of incalculable value; the result would establish the permanency of the Ruby Hill lode; it would insure the life and prosperity of Eureka on a stable and broader scale for a great many years; it would revive mining on Ruby Hill; timid capital would acquire new spirit; the Richmond Co. would feel warranted in making an outlay similar to that of the Eureka Con.; prospecting would be resumed, and the number of men employed on day's pay be enlarged to what it used to be in the bonanza days of these properties; mining throughout the entire district would be renewed with ardor and confidence; real estate values would climb back to former figures or mount beyond; money would be plentiful, and the cry of hard times and shrinkage be heard no more on the Base Range.

The Outcome.

We believe that we are on the eve of all the happy expectations that are based upon explorations through the Eureka Con. new shaft. Ore has been found. It is an extensive body, and known to be widening with depth. We are not at liberty to give the measurement, but we can say that the development is such as to gratify, for the present, those who anticipated the most splendid results.

The Strike.

The strike occurred last Friday night at 11 o'clock. We have a specimen of the ore taken from the ledge that assays $40.10 in silver and gold. The drift struck the ledge at a distance of 300 feet southwest. It had been calculated that the ledge would be struck somewhere between 300 and 350 feet. The ledge where struck was found dipping at an angle of sixty degrees to the northeast and running northwest and southeast. When the ledge was cut indications of water were discovered, and as there were no preparations at that time to handle an increased flow of water, a drift was started along the eastern wall of the ledge in a northwesterly direction, with the intention of crosscutting every 100 feet. Samples of ore taken from the ledge in the workings opened assayed from $13 to $40 per ton. The depth at which the ledge was run into is 166 feet deeper than the lowest level, the 14th, of the old mine. The flow of water at present, we learn, is not more than ten gallons per minute. Whatever flow may occur will be easily managed by the mammoth machinery constructed with reference to handling the greatest quantity that might occur.

More definite results must be watched for. Whether there is a bonanza in sight or not is certainly of importance, but the grand result is reached. There is ore deep down—166 feet deeper than ever prospected for before.

Soda Lake Mines.

At frequent intervals within the past two months it has been reported that rich discoveries of silver ledges had been made in the vicinity of Soda Lake, about sixty miles east of here. The fortunate discoverer of these ledges was reported to have been a prospector by the name of P. M. Livingston. It seems that he has kept the exact location of the ledges a secret, and although several parties endeavored to find the spot, they failed in the attempt. Mr. Livingston is a cabinetmaker by trade, and having worked many years at the same without accumulating anything beyond a moderate living, came to the conclusion about a year ago that he would make a fortune in some way, or "die in the attempt." All the various avenues for money making passed in review before his mind, but among them all he came to the conclusion that mining was the quickest and surest way of making a fortune. No sooner had he came to that conclusion than he immediately made all the necessary preparations for a long prospecting tour. Providing for the comforts of his family during his absence, he started fourth to discover some of the hidden treasures in the earth. Hearing of rich strikes in San Bernardino county, he prospected in the districts in this part of the county, but all he could find was many monuments, so he continued his course further east, until one day he discovered mineral near Soda Lake, up in the mountains where no signs of the indefatigable prospector could be seen. This discovery thrilled him with joy, and hope unfolded to his expectant mind a vision of future wealth and happiness. Keeping the discovery a secret, he proceeded to prospect the ledge, and the longer he worked, the more he thought it was rich. Taking a number of specimens to Hawley's station, he had them assayed by Mr. Gould, of the Alhambra mill. They were so rich that Mr. Gould and Lieut. Gov. Daggett were very desirous to know where they had been found; but Livingston was quite reticent on that point. Finally, for a certain consideration, the Governor and Mr. Gould were given an interest in the ledge which Livingston had discovered, and they sent a man out there with him to assist in opening the mine. They prospected carefully for a couple of months, which resulted in the sinking of a shaft about five feet, and the taking out of eight sacks of ore that assays very high, and which was shipped to S. P. Holden, ore buyer of San Francisco, week before last.

The above claim is situated high up in the mountains, about two miles from a good spring of water. The ledge is said to have regular walls, and is well defined. It will require considerable work on the same to determine whether it is the beginning of an extensive and rich deposit. For the sake of Mr. Livingston, who is a worthy and industrious citizen, we hope he is on the road to fortune, and that all who are interested in this prospect will share with him the same when it is realized.—*Calico Print.*

Borax Business.

Several months ago some large deposits of borate of lime were discovered in east Calico, portions of which were sold to Wm. T. Coleman & Co., of San Francisco, for several thousand dollars. These sales created considerable excitement in the district, and a number of parties started out in all directions to search for similar deposits. For awhile "borax" was the common topic of conversation. But no important discoveries were made of this article since the above mentioned sales. Judging from what we can learn concerning the nature, supply, and demand for borate of lime and borate of soda, we think that the ideas of most prospectors in search of this substance are considerably exaggerated, and that there is not so much money to be made out of the sale of borax in its crude state, or the manufacture of the same for commercial uses, as is generally supposed. The supply of this article is very great, as it is extensively found in Southern California, Nevada, and other regions, but the demand is exceedingly limited. In fact, the market is already glutted and a decline in the market is expected at any day. For prospectors to spend their time looking for borax deposits when the chances of selling them are so meager is to engage in an unprofitable undertaking. If large deposits should be discovered it would not pay to manufacture the borax, for the forcing of an excess of production on the market would reduce the price so low that it would be unprofitable. Some think that boracic acid is very valuable because it is worth about fifty cents a pound, but it must be taken into consideration that it has no market on account of the few uses for which it is needed.—*Calico Print.*

WE HEAR that the extension of the Cedarburg north of the Morrell, is showing up some good milling ore. Greenwood mining district bids fair to experience a healthy revival in gold mining. The Morrell has already come to the front, and favorable reports continue to come from developments now going on in other mines.

California Petroleum.

The following is from the Santa Barbara *Press*:

"What do you think of the proposition announced in the Los Angeles papers of supplying that city with fuel from the petroleum wells near Newhall?" asked a *Press* representative of Col. James H. Swift this morning.

"I think the effort, if made, will undoubtedly prove a success, replied Mr. Swift, who is a reliable authority on petroleum and asphaltum affairs in Southern California; "and not only a success in Los Angeles, but in all other portions of these southern counties, and particularly in Santa Barbara."

"What of Santa Barbara? Has it not all the fuel it requires for years in its scattered live-oak groves?"

"This is what I mean about Santa Barbara. I am speaking not of the present, but of the future. We have right here within a few miles of where we now stand the largest and finest deposit of coal oil on the Pacific coast. This city is built upon a strata of flowing petroleum, and within a few years the export of crude oil from this country will be its principal and most profitable business."

The Reason Why.

"How is it, if your assertions are correct, Mr. Swift, that the oil deposit here is not being developed, while at Ventura and at the Pico wells, near Newhall, large quantities are being pumped and marketed?"

"Because we have not yet made the proper effort. The time is fast approaching when pipes will be laid from the oil wells in the mountains, between Montecito and Carpinteria, to the seashore, where wharves will be arranged for barreling and shipping the crude oil to all portions of the coast. There is a flow of petroleum from dozens of springs not far from the coast, which is now going to waste, which might be made profitable now."

"Could the crude petroleum from these springs you speak of be as conveniently transferred by means of pipes to the seashore as it can at Ventura from the oil wells above?"

"Yes, and much more so. I can lay a pipe from these oil wells I speak of a distance of four miles, and run a ceaseless stream of oil to the Carpinteria wharf; or, by laying a pipe to the Matanza place at Ortega hill from the springs above, I can send down oil from the mountain canyon,

A Fall of 2,000 Feet,

In a distance of seven miles. At Ventura they have to pump their oil a distance of from twelve to twenty miles to the wharf. Here at Santa Barbara the oil would flow by natural gravitation down to a shipping point on the seashore."

"Is there any question as to the existence of coal oil in large quantities—large enough say to justify the construction of work and laying pipes?"

There is no question whatever, as Santa Barbara is not only in the center of a well defined coal oil belt, but the lower end of the belt opens into the ocean near Dos Pueblos rancho, between this city and Point Conception. There the surface of the waters of Santa Barbara channel is covered at all times with a film of coal oil which can be seen from the decks of passing vessels at almost all times, while upon the shore and beneath the water large deposits of asphaltum can be seen. This is the lower or western end of

The Coal Oil Belt

Which runs through these coast mountains. I have traced the oil belt from near the wells up near Newhall, on the edge of Los Angeles county, through Ventura and Santa Berbara, a distance of more than sixty miles to where the oil is discovered wasting itself in the waters of the ocean not far from Hollister's ranch."

"Why do you consider the oil wells near to Santa Barbara the best portion of this long extended deposit of petroleum?"

"Because it is near to the surface, flows stronger and can be saved and marketed cheaper and in larger quantities than at any other point. I have visited all the canyons in these mountains exploring for oil indications, and know whereof I speak. I can take you by a drive of a few miles from Santa Barbara where you can see a stream of crude petroleum as large as your hand flowing out of the earth by the side of the mountain, and in the vicinity of this at least a dozen more springs of oil, while thousands of tons of asphaltum can be had for the hauling. As I said before, a two-inch pipe laid upon the top of the ground will send a steady two-inch stream of crude oil to the seashore from these undeveloped oil regions, and as I before asserted, the coast

Oil Resources of Santa Barbara

Will make this the principal source of fuel supply in the State. Coal oil is the forthcoming fuel for this timberless region, and we have inexhaustible quantities of it which will load itself into tanks on the beach without pumping."

Mr. Swift has spent a large amount of time and money in petroleum investigations near here, and his confident assertions are the result of practical experience. He is the head of a local company organized for boring for oil some years ago, which has suspended operations for the want of capital to prosecute the work. When these operations are resumed, Santa Barbara may count upon some interesting and profitable developments.

USEFUL INFORMATION.

A New Source of Albumen.

Albumen is a substance indispensable in many processes of manufacturing. It is among the most nutritive properties of beef and vegetables, but almost the only source from which it has hitherto been obtained as a merchantable commodity is the hen's egg, the "white" being pure albumen. In supplying the demands of commerce for this article the barnyards of France have been taxed to the utmost. As eggs are rarely found in other countries beyond the local requirements for food, very naturally the cost of albumen to the consumer is high, ranging from $1.25 to $2.40 per pound, and the trade is commonly supposed to yield enormous profits. The scarcity of this indispensable commodity has set scientists at work to discover some new source for its supply; and we have recently seen it asserted that Prof. Uno H. Hellman, a Scandinavian chemist, has discovered a process of producing albumen in unlimited quantities from an entirely new source, and one which is literally as broad as the ocean. The source referred to is the spawn of fish, so that our cod, menhaden and shad fisheries are to contribute additional wealth from their hitherto waste products. It is predicted that these interests must ultimately receive an immense impetus from increased profits, and that the United States Fisheries Commission will find an incentive for doubling its efforts in fish propagation. Extensive works are in course of erection on the Massachusetts coast, and the United States Albumen Mfg. Co., who own the exclusive right to manufacture albumen and all its products from the spawn or ova of fish, expect soon to begin operations on an extensive scale. Their capital of $300,000 is said to be in strong hands. The process is simply to separate the spawn from the inclosing membrane, crush it in machinery, and the albumenous water resulting is boiled in a vacuum at a temperature not exceeding 115° F. Albumen is consumed on a large scale in cotton mills, print works, by manufacturers of fine stationery, and in many of the arts. A process which promises to reduce the cost more than one half is of some importance.

SCRAPINGS OF HORN.—The fine scrapings of any common cattle's horn steeped in vinegar and bound hot as can be borne upon a wound will subdue pain almost instantly, and effectually subdue lockjaw. I have often used this remedy, and have never had a failure. In wounds torn and lacerated, as for example, where a nail has been stepped on penetrating the sole of the foot, and the patient wild with pain, countenance livid, teeth chattering, limbs trembling and lockjaw seeming inevitable, with this remedy I have produced perfect quiet, relaxation of muscles and freedom from pain, and even from soreness of the wound, in the space of 15 minutes time. I was called in haste to see a young man of 15 years who had stepped on a nail. I found him almost in spasms and had no remedies with me. In the house I found a powder horn, and with a piece of glass went to scraping. As soon as I had a common thimbleful I barely covered it with vinegar and heated it as hot as could be borne, and, setting others to scraping, I applied it to the wound, changed often as soon as cool, adding the scraping accumulated, and with this treatment had the boy easy and out of danger in 15 minutes. I know not what there is in horn that produces this effect, which I have seen many times, and have often wished there might be some preparation of this remedy a little more convenient to use than the crude material.

A USEFUL KIND OF SOLDER.—A soft alloy which attaches itself so firmly to the surface of metals, glass and porcelain that it can be employed to solder articles that will not bear a very high temperature can be made as follows: Copper dust obtained by precipitation from a solution of the sulphate by means of zinc is put in a cast iron or porcelain lined mortar and mixed with strong sulphuric acid, specific gravity 1.85. From 20 to 30 or 36 parts of the copper are taken, according to the hardness desired. To the cake formed of acid and copper there is added, under constant stirring, 70 parts of mercury. When well mixed, the amalgam is carefully rinsed with warm water to remove all the acid, and then set aside to cool. In 10 or 12 hours it is hard enough to scratch tin. If it is to be used now, it must be heated so hot that when worked over and brayed in an iron mortar it becomes as soft as wax. In this ductile form it can be spread out on any surface, to which it adheres when it gets cold and hard.—*Amateur Mechanics.*

A CHEMICAL FOOD PRESERVATIVE. — For many years chemists and others have sought in vain for some compound which possessed the property of preserving food substances without injuring them as foods. The long-sought article seems to have been found at last in a new compound known as boro-glyceride. The compound is made by dissolving boracic acid in glycerine by the aid of heat. About three parts of glycerine and two of boracic acid are the proportions required. The boro-glyceride is dissolved in fifty parts, by weight, of water, and is then ready for use. The discoverer claims to have preserved fish, eggs, meat and various other foods for more than three months by simply immersing them in the solution, which may be used repeatedly, as it is not absorbed by the food substances immersed in it. We cannot as yet speak from experience, but we believe this is a safe preservative agent, at least for such foods as eggs and butter, and perhaps for some perishable fruits and vegetables. We shall experiment with the article this summer, and report the result.

WHAT MAKES CORN POP.—Chemists who have examined Indian corn find that it contains all the way from six to eleven parts in a hundred (by weight) of fat. By proper means this fat can be separated from the grain, and it is then a thick, pale oil. When oils are heated sufficiently in closed vessels so that the air cannot get to them they are turned into gas, which occupies many times the bulk that the oil did. When pop corn is gradually heated and made so hot that the oil inside the kernels turn to gas, this gas cannot escape through the hull of the kernels, but when the interior pressure gets strong enough it bursts the grain, and the explosion is so violent that it shatters it in the most curious manner. The starch in the grain becomes cooked and takes up a great deal more space than it did before.

SWEATING OF VARNISH.—Varnish is liable to "sweat"—that is, to have a glossy appearance after it has been rubbed and allowed to stand a while, whenever the coat has been applied too heavy and has not dried through, or if too much rubbing is done. The rubbing coat is too often applied carelessly, with the thought that all defects, such as specks and brush marks, will be rubbed out, but this necessitates so long a rubbing that the life of the varnish is destroyed, and sweating then follows. However, sweating is of little moment in the hands of an experienced workman, for he will rub the job and put the varnish on before it has time to sweat.

CANARY BIRDS are natives of the Canary Islands. The native bird differs materially from these we now have in cages. It is not as large, and the color of its plumage is somewhat different. The original stock is said to have been imported from the Canary Islands about the fourteenth century. There are about fifty varieties of this bird.

ACCORDING to Weidemann, a shark belonging to the genus *Scyllium* is phosphorescent on its whole under surface, with the exception of a black stripe on the neck. The upper surface is non-luminous.

GOOD HEALTH.

Regulating Diet.

The human body is exhausted of its elements day by day very much as a piece of cultivated land is from year to year. But the required proportions of these elements change with the seasons and weather. We should neither eat the same quantity nor the same kind of food in July as in January. All food contains two principles—carbon to produce heat, and nitrogen to build up muscle. Those who work hard require much nurishment of nitrogenous character to build up muscle; those who are exposed to much cold require much carbonaceous or heat-supplying food. Greenlanders crave for fat and oil, while people of tropical climates have a natural craving for fruits. Says the *Journal of Health:* "A wise man will take but little carbonaceous food on a suddenly hot day, but if suddenly cold, he will eat pleutifully of fuel-making food. An infinite number of fevers and cold would be avoided if timely attention were paid to these things. By the aid of these statements, the following tables may be used to great advantage, showing the amount of carbon or of heat-producing principle in several articles of food. There is not one per cent of nitrogen, of flesh-forming prineiple, in fruits, berries, and the more common vegetables. Meats have about fiftcen per cent. The meats average twenty-five per cent of nuitriment—that is, including both carbon and nitrogen. Of all meats, mutton is the most nutritious, thirty per cent; fish least, twenty per cent. Of all vegetables, white beans are the most nutritious, ninety-five per cent; wheat flour, ninety per cent; turnips, the least, five per cent. Of fruits, plums are the most nutritious, thirty per cent; apples, seventeen; melons and cucumbers, three; the rest being mere water and waste. The more waste, the more open the bowels are. The following table shows the percentage of carbon:

Apricots.....	0	Potatoes.....	11
Berries.....	0	Lean Meat....	13
Cherries.....	0	Rye Bread....	31
Currants.....	0	Gum Arabic..	36
Turnips.....	3	Arrow Root ..	36
Artichokes..	9	Green Peas ...	36
Blood.....	10	Starch.....	37
Milk.....	10	Lentils.....	37
Wheat Bread..	40		
Sugar.....	42		
Apples.....	45		
Fat Meats....	53		
Butter.....	65		
Soup.....	75		
Lard.....	80		
Beans.....	88		

SLEEP.—Men, women and children require just so much sleep, and if they do not have it, suffer in consequence. I do not think a person should be waked in the morning, and for this reason, when a man falls asleep, he is in the shop for repairs, as the railroad men say. His frame and all its intricate machinery is being overhauled and made ready for the next day's work. The wear of the previous day is being repaired. Nature is doing that herself. She knows what the tired frame needs just as she knows how to make the heart throb and send the blood coursing through the veins. Then she takes that tired frame, lays it down on a bed, surrounds it with the refreshing air of night, covers it with the soft darkness and lets the man rest. "Tired nature's sweet restorer, balmy sleep," visits him, and as the hours wear by his energies are renewed, his strength comes back, and finally, when morning breaks and the sunlight steals through the lattice, he opens his eyes and is himself again. Or, if he is early to bed, he awakes with the cocks crowing. Now, who shall go to that man's side an hour before he opens his eyes, and say to nature, stand aside and let him get up; he has had enough of rest? Well, nature will say: "You can take him if you will, but I will charge him with an hour's loss of sleep, and I'll collect it out of his bones and nerves and his hair and eyesight. You can't cheat me. I'll find property to levy on!"—*Journal of Health.*

POISONED BY HANDLING HIDES.—In New York City, a short time ago, a man died from poison, communicated while handling some buffalo hides sent from India. His companion worker employed on the same job was taken sick, and after a severe illness finally recovered. Both the men became warm, perspired freely, and repeatedly wiped the sweat from their faces with the bare hand, each of the men having a pimple on the face. Whether the death of the one and the illness of the other was caused by the virus from the hide of a diseased animal, or by the absorption of arsenic used in the preservation of the hides, is not positively known. Probably, however, the cause was disease communicated from an infected animal through its hide, as the Calcutta packers use, frequently, an arsenical preparation on the hides to kill a small brown worm that otherwise might destroy the hides, and instances of poisoning in handling these hides are not uncommon. Some years ago an importer of hides in New York died from the effects of a bite or sting of a fly which inhabited the loft where the hides were stored.

BEEF tea has small nutritive value. It may be taken lukewarm, or cold, or iced. Too great a quantity need not be made at once; nor is there any particular advantage to be gained by making it so particularly good and strong, as some persons imagine. The prevaleut impressions about beef tea show how little real knowledge exists about our food as regards our requirements. Beef tea is a stimulant rather than a food. A person may be hungered to death on it. It is a pleasaut, palatable, refreshing beverage when well made. As a vehicle for farinaceous matters, or with a teaspoonful of cream in it, it is useful as a food. Liebig's extract, and the other extracts, are all pleasant beverages, and may be taken hot, lukewarm, or cold, or iced, as occasion requires, or the taste of the patient directs. Preparations of meat juice are in the market, which are very suitable for the invalid. Then mutton may be used, or chicken, or mixed meat. All these are useful; or the patient may prefer eel broth.

POISONING BY CHEESE.—Several persons of Lynn, Mass., were recently poisoned by eating cheese. The eminent chemist, Prof. Bowker, of Boston, analyzed samples of the cheese, and reports that he finds no "foreign fats or substance not found in natural cheese." The chemist suggests that the ill-effects arising from eating the cheese were due to some animal poison, which eludes detection by chemical analysis. Cases of poisoning by cheese are very common. We have long held the opinion that this article ought to be discarded altogether as a food substance. It is a wonder to us that the number of cases of poisoning from the eating of cheese is not much greater. We have often seen persons eating cheese in which the formation of mold was so extensive as to give the cheese the appearance of having been thoroughly penetrated by a moss-like growth.—*Good Health.*

POISONOUS ROUGE.—A girl named Hernals was found lying insensible near a Vienna hospital a short time ago. She was breathing, but to all appearance dead. On being taken to the hospital, the doctors pronounced the case to be one of poisoning. When brought to herself again, she declared that after the sparing use of some new rouge, a strange sensation came over her, and she told her mother she must go out for a little air. On reaching the hospital she fainted, and was found in that condition. The rouge being examined, was found to contain several poisonous ingredients, and no doubt has been the cause of many deaths.

OLD POTATOES.—Those who eat this vegetable should avoid both old potatoes and those which are new and unripe. It ought to be known and remembered, just at this time, that both old and unripe potatoes contain a poisonous substance known as *solanine*. Potatoes which have begun to sprout are certain to contain a quantity of this poison, and hence should be avoided, unless very great care is taken to remove the sprouts very perfectly, and then they are better buried than eaten.

A NEW DISEASE.—It is recently reported that a disease of a very peculiar nature has made its appearance in New South Wales. Persons affected with it exhibit symptoms very similar to those of hydrophobia. The malady is attributed to the use of the flesh of sheep infected with parasites.

PHYSICIANS say that ginger ale is a poor substitute for water, because the capsicum it contains irritates the lining of the stomach and produces dangerous inflammation.

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SAN FRANCISCO:
Saturday Morning, Sept. 1, 1883.

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Passing Events.

The great Triennial Conclave is over, and most of the visiting Knights have departed after having thoroughly enjoyed themselves at the various entertainments and excursions arranged for their pleasure.

A great many claims have been located of late in the San Gabriel mountains in this State, where a new mining district has been laid out.

The Northern Pacific railroad, the completion of which is now announced, will open up a large area of mining ground heretofore lacking the means of transportation. The season is now so late that the benefits of the road will not be shown up in this connection before next summer. Our northwestern Territories have such severe winters that only the best equipped mines can be worked during the winter months.

The Denver Mineral exposition seems to have been a failure, as there is a general disposition to withdraw the exhibits, which, however, is not permitted by the managers. There has been a very slim attendance since the opening.

THE Hollister *Democrat* says of the recently discovered gold mines in the Gabilan mountains, thirty-five mining claims have already been located, and others are being located daily. Three shafts and one tunnel have already been opened, and the quality of the ore improves as work advances.

The Virginia *Chronicle* says: "It is said that the Overman Mining company contemplate buying the old Petaluma mill, in order to work the ore at present being extracted from the croppings by means of a tunnel near the old Overman works, on Petaluma street."

Temperature of Rocks.

According to the evidence of the members of a Parliamentary Commission of Great Britain for inquiring as to the possible depth of coal mining, the temperature of the strata in horizontal coal workings accords with the rise and fall of the surface above; but there is reason to believe that this rule will only apply to gradual variations of surface, and not to abrupt prominences in the nature of peaks, since in the Mt. Cenis tunnel the temperature of the rock is very much less than would be due to the depth measured from the top of the mountain. It may, however, be assumed that under the ordinary configuration of the surface the increase of temperature will have reference to the depth from the surface of the ground, and not from the level of the sea. High temperature of the strata operates as an impediment to deep working by heating the air circulating through the passages of the mine. When cool air enters a heated mine it absorbs heat from the surfaces of the passages through which it flows, and the rate of this absorption somewhat exceeds the ratio of the difference between the temperature of the air and that of the surrounding surface with which it is in contact.

By the absorption which thus takes place the air is heated, and this heating process is most rapid at first when the difference of temperature is greatest, and gradually diminishes as the length of the passage is extended, never ceasing until complete assimilation of temperature is effected. The progress towards assimilation of temperature is much more rapid when the air comes in contact with the working face of the coal, which from being nearly exposed is more highly heated than the surfaces of the permanent air courses. The rapidity, however, with which the air takes up the heat from the working face depends, in a great degree, upon the system of working. In the celebrated system called "Pillow and Stall," the air seems to acquire almost immediately the full temperature of the coal. But under the "Long Wall" system there are instances of the air retaining a considerable inferiority of temperature after sweeping past the working face. The great outlay of sinking pits to coal lying at extreme depths, would render it necessary to work a large area of coal for each sinking, and this would involve air courses of great length. It thus becomes necessary to consider the question of ventilation under the double aspect of great depth from surface and great length of air passages.

Mineral Land and Agricultural Claims.

It is often stated that such and such a ranch is more valuable for its mineral than agricultural land, and ought never have been taken up as a farm. But in fraudulent proceedings under agricultural claims, to obtain title to mineral lands, it is obvious that no broad rule can be arbitrarily enforced under the present laws. Land which is, in fact, non-mineral, is subject to agricultural entry; and if a person seeks under such entry to obtain title to a mineral tract, it is the duty of miners and others who may know its real character to appear at the District Land Office and submit proof of the facts. The knowledge of the character of any certain tract is local, and the Land Office must necessarily depend on parties in the immediate vicinity to prevent fraud. Published notice of thirty days is required of parties who seek agricultural entry on lands withdrawn as mineral, and everyone is thus advised and given an opportunity to defeat fraudulent entry.

If under the present laws those interested in preventing fraudulent entries will avail themselves of the means furnished by existing regulations, and appear and insist on their right to submit their testimony at the hearings, and notify the U. S. General Land Office of any refusal to receive testimony, or irregularity of proceedings, a just conclusion can usually be reached; but without the co-operation of those interested in an honest disposition of the public lands, it is apparent that the Land Office labors under great embarrassment. Any citizen has the right to go and offer testimony to prove the land is more valuable for mineral than for agricultural purposes.

LAST week 19,000 pounds of machinery arrived at the depot for the gold quartz mill at Camp Cady. In a few days the engine and other machinery will arrive. In about a month the mill will be in operation.—*Calico Print.*

Mono County Minerals.

Mono county has two cases of minerals at the State Mining Bureau, which were sent by the county for exhibition here during the Conclave, and they will be kept here. Among those things of interest are the following: Fine grained diorite, from Mineral Hill. There is a slide with this for microscopic examination. Pyrargyrite and Proustite crystals in quartz from Oro mine, Bodie; tufa from Sulphur Springs; salt from the Inyo range, forty miles from Independence, and near Benton; presented by J. H. Crossman. Pumice stone. Obisidian from near Mono lake, Melville Attwood; galena from May Lundy mine, Homer district. Azurite with malactite and cuprite from Kessick mine, Benton, J. M. Classen. Gold on quartz crystal, Beveridge district, J. H. Holt. The gold has the appearance of having been formed in the crystal, but close inspection shows that it is cemented on the outside by oxide of iron. Quartz crystals doubly terminated, Standard mine, Bodie. Porphyry, footwall of Standard mine. Molybdenite, Minnie mine, Sweetwater range. Native silver in partzite, Camanche mine, Blind Springs, Joseph Wasson. Thinolite—several specimens and very interesting. This is a travertine—carbonate of lime—which deposits from the supersaturated solutions from the alkaline lakes of the great basin. Great abundance at the different lakes. It forms immense masses, and they burn it now for lime. Clarence King named it some years since. Clay slate bored by worms, Mono lake. Altered quartzose, trachytic diorite, the feldspar mostly sanidine, hanging wall, Standard mine. Fine grained diorite (with microscopic section). Dolerite, east wall Camanche mine.

There are numerous specimens of gold quartz from the mines of Bodie district contributed by Jno. F. Boyd, J. H. Redmond, W. P. Jenney, Wm. M. Lent and Joseph Wasson. With these are specimens of red float rock, cap rock, etc. Silver ore from Prescott district, J. Casarello; galena from Homer M. and M. Co.; silver ore from Benton district, from Gray Eagle mine; silver ores from Bodie, from E. B. Haft, John Dixon and H. M. Levy; silver ore from Ahuaga mine, summit of Sierra Nevada, 1½ miles northwest of Mt. Dana; silver ore from Prescott district, Bloody canyon; also from Golden Crown mine, head of same canyon. There is one complete set of ores from the lower levels of the Oro gold and silver mine, Bodie, specially interesting as resembling the ores of the Comstock.

Argentiferous galena (with bleude and glocronite) from Garibaldi mine, Prescott district, from J. Casarello. Silver ore from Camanche mine, from H. M. Levy. There are samples of water from Mono lake, and from near Bridgeport, the latter spring having deposited a very large quantity of Aragonite or calcite. Copper from Detroit mine, Jordan district, A. J. Howk. From Patterson district there are quite a number of specimens, the following mines being represented: East Lookout, Great Western, Magnolia, North Lookout, Silverado, Kentuck, Daisy, Homestake, Omega and Poverty. The May Lundy sends some of its peculiar, but rich ore. Gold ore from Porcupine mine, Lundy, from Mr. LeMoine. Silver ore, Ella Blossom mine, Prescott district. Horn silver from Kentucky mine, Sweetwater. Copper from the Monmouth mine, J. F. Johnson. Variegated obsidian, McBride's ranch, J. M. Graham. Iron ore (magnetite), Solid Iron mine, Indian district, from D. P. Tarpy. An analysis shows this to contain peroxide of iron, 93.00; silica, 7.00, with traces of graphite and sulphide of copper.

There is a specimen of the lava which exists in immense quantities on the borders of Mono lake. Owens river cuts through this formation in a deep canyon. It is easily decomposed, and supposed to yield the soda salts so abundant in that region. It also crops out at Adobe meadows. This county shows up well in its mineral productions, but there are many more mines which should be represented.

CARSON FOOTPRINTS.—In the MINING AND SCIENTIFIC PRESS of Aug. 18th appeared an article on the Carson Footprints, which was read before the California Academy of Sciences by Dr. H. W. Harkness, who made the original investigations on the subject, and whose first paper was widely read and commented on. In the late article to which we refer, Dr. Harkness' name was accidentally omitted.

Testing Gold Sands.

As a general proposition, the results of assays of gold ore are not as satisfactory or reliable as those made for silver. The ordinary fire assay for gold, especially if the ore be of low grade, cannot be relied on. Very great care has to be exercised in the selection of the sample in the first place, and the amount of gold is so minute that only delicate manipulation will properly save and weigh it. The finest of balances with nice adjustment are required; and, altogether, when the whole is considered, miners of experience would rather judge from the results of "horning," or panning out a good liberal sample of ore properly pulverized. They can tell by the "colors" about what the ore will yield at the mill. In assaying gold ore by the blowpipe, the results depend greatly on the operator's skill, and his judgment in the selection of samples.

In assaying the gold sand of the rivers, streams and sea beaches of this coast, some difficulty is met with. It contains a great amount of specular and titanic iron, and is called "black sand." by the miners. Platinum and iridium are often found in the same sand. Mr. George Attwood, in his "Blowpipe Assaying," gives a convenient method of testing these sands:

"Take 100 to 1,000 grains, and attack with *aqua regia* in a flask; cool for about thirty minutes or more; dilute with water and filter. If gold is present it will now be held in solution in the filtrate. Remove the filter and evaporate the filtrates to dryness; then add a little hydrochloric acid and redissolve the dry salt in warm water; add to the solution so formed protosulphate of iron, which will throw down the gold in the form of a fine, dark precipitate. This precipitate is seldom pure, being mixed with oxides of iron, and must now be dried in the filter paper, and both burned over the lamp in a porcelain dish. Then mix the dried precipitate with three times its weight of lead; fuse, scorify and cupel. In case platinum, iridium, etc., are found associated with the gold, an extra amount of pure silver should be added before cupellation, and the gold button will be found pure."

Overwinding at Shafts.

It is noticeable that one of the most frequent causes of accident in mining operations of a few years ago has almost entirely disappeared. One of our commonest sources of fatal accidents was "overwinding" or hauling the men up into the sheaves when hoisting them out of the shaft. Of late we very seldom hear of any occurrence of the kind. It got to be so common at one time that a number of inventors set to work to apply a remedy. Many inventions were perfected to prevent overwinding, and as these have been adopted, they have accomplished the object pretty thoroughly. We have from time to time described the appliances referred to as each new one came up, and now there is no cause for any superintendent or mining company to allow employes to be hurt in this way.

Not only has this class of accidents been done away with here, but in Europe also. One of the government inspectors of mines in a very populous district in Great Britain records the fact in his annual report that not a death from overwinding has occurred in the year. This is evidence of the great care exercised by those persons having charge of the winding machines, and it also shows the wonderful control the workmen have over them, taking into account the large output and the men who are lowered and raised every day. Most of the winding arrangements have attached to them disengaging hooks for prevention of overwinding. They have, in all probability, been the means of saving property, and perhaps lives, but like all other self-acting apparatus, they require attention, frequent examination and testing. Another inspector of another district, in mentioning deaths from accidents in shafts, says the year's record is one for congratulation. About 50,000 persons ascend and descend the shafts in his district, yet there were but four deaths, and he does not register a single case of overwinding attendant with fatal consequences. Plenty of instances might be cited to show where fatalities would have occurred but for the use of detaching hooks. In order to keep the loss of life in shafts reduced, ceaseless attention and watchfulness are necessary, both as to the shafts themselves and the strength of machinery.

Blasting in Mines.—No. 6.

Line of Least Resistance

As the pressure of a fluid is exerted equally in all directions, the surrounding mass subjected to the force will yield, if it yield at all, in its weakest part, that is, the part which offers least resistance. The line along which the mass yields, or line of rupture, is called the line of least resistance, and is the distance traversed by the gases before reaching the surface. When the surrounding mass is uniformly resisting, the line of least resistance will be a straight line, and it will be the shortest distance from the center of the charge to the surface. Such, however, is rarely the case, and the line of rupture will therefore in most instances be an irregular line, and often much longer than that from the center direct to the surface. It will be obvious, on reflection, that the line of least resistance will be greatly dependent upon the texture of the rock, which may vary from one point to another; its structure, which renders it more easily cleavable in one direction than in another; the position, number, and direction of the joints which separate the rock into more or less detached portions; and the number and relative position of the unsupported faces of the rock. All of these circumstances must be ascertained, and the position of the bore hole determined in accordance with them, in order to obtain the maximum effect from a given quantity of explosive. It must not be supposed that this is a labor involving minute examination and long consideration. On the contrary, a glance is generally sufficient to enable the educated eye to estimate the value of the circumstances before mentioned, and to determine accordingly the most effective position for the hole. The ability to do this is always claimed by workmen. They can see, they say, which is the best position for the charge. To those who possess the requisite knowledge of rock structure and the action of expanding gases, the determining circumstances are certainly apparent. But in a great majority of cases, this *seeing* amounts to little more than following the rule of thumb. And if there be one operation less subject to this rule than any other, it is that of blasting, in which the conditions vary from hole to hole. The possession of such knowledge should, therefore, be deemed essential. Without it, every blast is necessarily of a tentative character; and to ensure the attainment of the end proposed in such cases, a superfluous quantity of the explosive compound is employed. Nor is this the only waste due to the same source; even by the expenditure of an additional quantity of the explosive, the work can seldom be effected without distributing this quantity among a larger number of holes. The object to be aimed at by the blaster is the accomplishment of a given quantity of work with the least labor of boring, and the least expenditure of powder. To attain this object, the first condition evidently is, to determine accurately the line of least resistance, or in other words, the most effective position for the bore hole. In practice, the line of least resistance is taken as the shortest distance from the center of the charge to the surface of the rock, unless the existence of natural divisions or differences of texture show it to lie in some other direction.

A Simple Water Lift.

What is known as a "California," or "Chinese" pump, is shown in the engraving on this page, and is a very useful device, more in vogue in early days, when placer mining was more common than now when so little of it is done. A canvas or leather belt (*b*) having short "buckets," or slats (*d*) nailed on it, revolves on a pulley (*h*) which is secured to the shaft of the drivewheel (*w*). A closed trough or box (*a*) is set on an incline into the water or pool to be drawn, and at its lower end carries a roller (*i*) around which the belt (*b*) revolves. The belt passes up the trough or box, and the buckets carry the water up, discharging at *e* into a ditch or flume. Power is derived from the water brought to the wheel by the sluice *y*. The pump can be run by hand, however, and is very frequently used that way. A simple tread power can also be used. Any one can make one of these pumps, as no metal is necessary in their construction. For lifting water for irrigating on a small scale, draining a mining claim or pool, lifting water to gain fall, etc., this style of pump does good service, more especially when the lift is not great, and the box may be set at a small incline.

Mining Debris.

The momentous questions involved in the debris controversy are exceedingly difficult of settlement. Every move towards a final agreement seems interminably long. The famous suit of Woodruff vs. the North Bloomfield mining company is still pending, not half the testimony even having been taken. The special commissioners appointed in July to take testimony in the suit have examined about 200 witnesses. The testimony covers more than 20,000 pages of legal cap, and the examiners declare they will not be able to finish within the limited

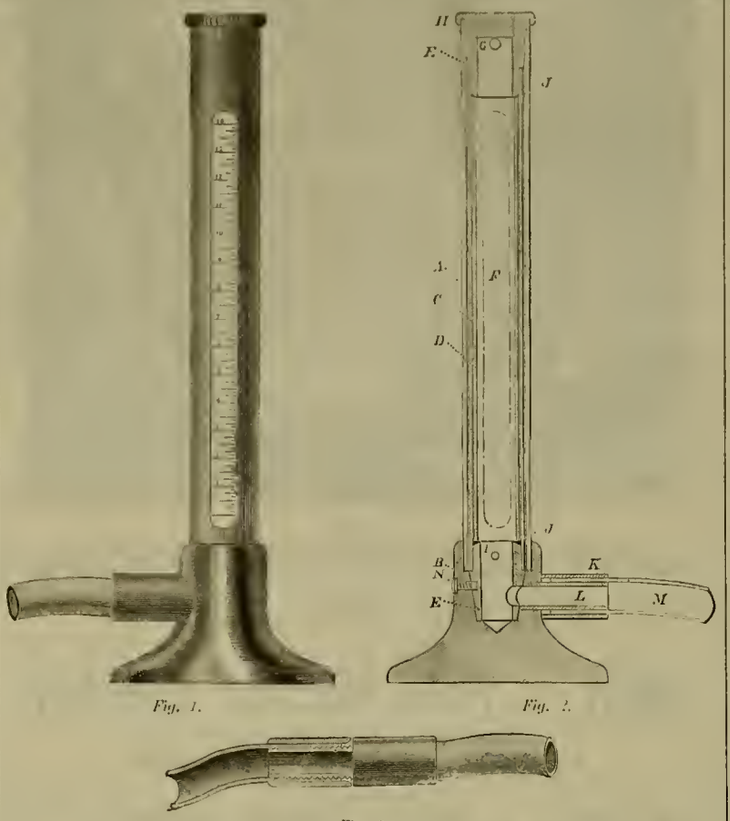


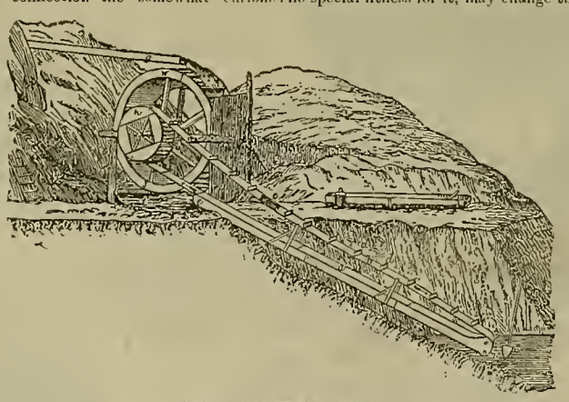
Fig. 1. *Fig. 2.*

Fig. 3.

Fig. 1. Outside View of Standard Hydrostatic Level. Fig. 2. Section of Standard. Fig. 3. Coupling for Flexible Tube. (See Article and Cut on Page 129.)

time, Sept. 11th, as the defense has produced but fifty witnesses, with the intention of calling up many more, and the plaintiff has the right to present testimony in rebuttal. More time will have to be given, of course.

In this connection the somewhat curious



THE "CHINESE" PUMP.

course of the Secretary of War, with regard to the money appropriated by Congress for the improvement of the navigation of the rivers of California, is remarkable. The trustees of the city of Sacramento, apparently considering themselves as possessing more influence than Congress, asked the Secretary of War not to use the money Congress had given for the specific purpose for which it was intended.

In answer to the request, the chief clerk of the Secretary of War telegraphs back to the Mayor and Trustees of Sacramento as follows: "Referring to your telegram of the 18th, the Secretary of War advises me that no orders for the expenditure of the appropriation for improving the Sacramento and Feather rivers will be made, unless, after careful consideration, it shall be deemed best for the public service. He says that if any action is taken it will be after his return to Washington. As at present advised, the Secretary of War does not expect to build dams without further action of Congress."

It seems strange, after Congress appropriates a certain sum for a certain purpose, first appointing competent engineers to report on the subject, and carefully considering it, that any individual, no matter who he may be, can nullify the whole thing. It is an arbitrary act. The Secretary of War does not know anything about the subject, yet he arrogates to himself the right to judge of a matter of vital importance which has already been decided in the opposite way by the highest tribunal of our land. That some one, never elected by the people, but simply appointed to a political position with no special fitness for it, may change the will of the people's representatives, no matter whether that will is right or wrong, seems an innovation in our Republic. If debris dams are wrong, Congress will find it out, but it is by no means in the province of the Secretary of War to find it out for that body after they have appropriated money to build them. J. B.

At the middle mines on the Comstock they have been somewhat delayed by the wearing out of the pins of the bobs of the Cornish pumps. Heretofore these pins have been rivited in, making it necessary to take off the head of the bob and take it to the surface when a pin is to be changed, as to drive out the old pin is a somewhat difficult job, but the pins now being put in are of a different pattern, and are fastened with a key instead of being rivited.

Mining in Frozen Ground.

In talking with an Alaska miner some time ago, he told us that in summer in the mineral region around Golowin bay, the ground was frozen to considerable depth, although mossy and boggy on the surface. At a depth of twenty feet in the shaft they had not got through the frozen ground. The heavy coat of moss seems to protect the ice, as ice is protected by sawdust and blankets.

Wm. R. Bentley, of this city, tells of miners working on frozen ground at very great depth. While at Rathdrum, Kootenai county, Idaho, in May last, his attention was called to a phenomenon in the vicinity, and he went out to the sawmills of L. B. Merriam, where there is a shaft 108 feet deep. From the surface down nearly 100 feet the soil is alluvial, being mostly gravel below eight feet.

At the lowest point the gravel is frozen solid. He descended the shaft and undertook to pick out portions of the wall of the shaft, but found it like cement, all of the interstices being full of ice. The shaft is cut into this frozen ground nearly ten feet, and appears alike to the bottom. The temperature at the bottom is very low, and gives one the sensation of being in an ice-house. How much further the gravel continues, Mr. Bentley is unable to state. The gravel at the bottom was like that at the top—stratification nearly horizontal. On the surface the timber is heavy fir and other evergreens.

We made mention not long since of the phenomenon at Aurora, Nevada. In the old Del Monte workings, 100 feet deep, two deserted tunnels intersect. There is a very strong draft through each tunnel, and at the point of intersection the temperature is below the freezing point. The water seeping down from the upper workings is frozen as fast as it drops at all seasons of the year.

Butte County Minerals.

In the Butte county case at the Mining Bureau in this city, which the county itself gave, are some very interesting specimens. The display does not by any means, however, properly represent Butte, and her citizens should see to it that the exhibit is increased. Mr. Louis Glass, of the Spring Valley mine, at Cherokee, sends numerous samples which illustrate hydraulic mine formations. There is a sample of the white top gravel from 20 to 400 feet thick overlying rotten bowlders; specimens of yellow or rotten bowlder stratum from one to ten feet thick overlying the gravel; blue gravel bottom stratum lying on bedrock from six to ten feet thick. Samples are shown, also, of the pyrites found in cleaning up the mine, and also of the platinum found with gold in the mine. An interesting thing is the bowl of diamondiferous sand found in cleaning up at the mine. A liberal sample is shown of the placer gold, and of the placer gold in cement; also gold amalgam before retorting, and several cakes of retorted amalgam. There are also diamonds, both cut and uncut, from the same mine. These are set in finger rings, and look exceedingly well. There is also a rough diamond weighing 180 milligrams, found in cleaning up the Spring Valley mine, by F. G. Williams. It was associated with zircons, platinum, gold and iridium. The display from this mine is very creditable indeed. Specimens from Minerva mine, loaned by W. C. Duncan. Basaltic lava showing a scale. Fragment from a bowlder of basaltic lava. The label on this specimen says it illustrates how angular fragments of rock weather into rounded bowlders without water-washing, this being convex on one side and concave on the other. Micaceous iron, from near Oroville, J. W. Collins. Chromic iron, Mount Hope district, near Forbestown, C. C. Cooledge. Asbestos, from near Oroville, R. J. Perrin. Asbestos, M. T. Blair. Asbestos, 18 miles northeast of Oroville, S. S. Sweet. This is a very fine sample. Picrolite, near Red hill. Slate from same locality. Limonite, Red hill, A. B. Paul. Bowlder of smoky quartz, H. G. Kuhl. Magnetite from near Oroville, S. W. Collins. Portion of tusk of mastodon, from Indian Spring drift mine, 320 feet below lava, A. B. Paul. From same mine, tusk of boar or peccary. Fine specimens of auriferous material from same mine. Section of jawbone of mastodon, from Magalia mine, from J. D. La Monte.

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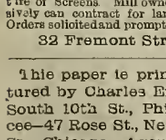
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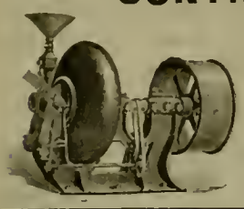
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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING AUGUST 21, 1883.

283,693.—LAMP REFLECTOR FOR STREET CARS—E. Boesch, S. F.

283,563.—VEHICLE WHEEL—James J. Bush, Tacoma, W. T.

283,581.—MAST FOR ILLUMINATORS—P. de Saisset, San Jose, Cal.

283,583.—HAND STAMP—H. C. Dorr, S. F.

283,594.—TREE PLANTER—L. Gairaud, Santa Clara, Cal.

283,596.—PAPER FILE-HOLDER—W. W. Gilman, S. F.

283,394.—PLOW AND CULTIVATOR FRAME—F. A. Hill, Benicia, Cal.

283,493.—CLUTCH MECHANISM—M. Kraker, S. F.

283,505.—NUT LOCK—E. Odell, Elko, Nev.

283,656.—AUTOMATIC CUT-OFF FOR ENGINE—John B. Pitchford, S. F.

283,657.—PILLOW BLOCK—Jno. B. Pitchford, S. F.

283,515.—INVALID SETTEE—John Rodgers, S. F.

283,668.—ADJUSTABLE HEAD FOR MILLING MACHINE—A. Schurch, S. F.

283,519.—TAILPIECE FOR BANJOS—W. A. Scollay, S. F.

283,522.—BRETZEL CUTTER—J. U. Segesser, S. F.

283,524.—STEP LADDER—E. A. Shumway, Walnut Creek, Cal.

283,529.—CYLINDER FOR THRASHERS—A. G. Stewart, Oakland, Cal.

283,532.—BALANCE VALVE—C. F. Taylor, Chico, Cal.

283,439.—FIRE ESCAPE—W. Torst, Bingham Canyon, U. T.

283,536.—CANDLESTICK—C. B. Tuckfield, Salt Lake City, U. T.

283,541.—WHIFFLETREE—E. H. Wade, San Jose, Cal.

14,226.—DESIGN FOR VASE—Chas. Nardini, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

BRETZEL CUTTER.—J. U. Segesser, S. F., Cal. No. 283,522. Dated Aug. 21, 1883. This bretzel cutter consists in a shield-like die, or stamp, provided with a double-spaced wall around its edge, in which an ejector is adapted to move, and with a hollow center crossed by radial walls, in the bottom of which grooves are made. At present bretzels are made both by hand and by machinery. The machines for accomplishing this work are constructed of two revolving impinging rollers, in the faces of each of which one-half the pattern or stamp is made. It is found by experience that by this means only the stiffest kind of dough can be used in order to prevent it from sticking to the shallow grooves of the pattern stamp, and thus occasioning loss. This entails the use of proving-boxes, in which the stiff dough, after being cut into bretzels, is placed to make it rise properly. The object of this invention is to provide a means of cutting the bretzels out of better and lighter dough which has not afterwards to rise, thus doing away with the proving-boxes, and saving much time and labor.

PILLOW BLOCKS.—John B. Pitchford, S. F. No. 283,657. Dated Aug. 21, 1883. In the ordinary construction of pillow blocks the wedges have been adjusted by screws passing through the pillow block cap and suspending them so that the cap could not be secured without moving them and disturbing the adjustment so that if the shaft were subjected to the strain of a heavy belt, or the thrust of gear, it was liable to be thrown out of gear. Mr. Pitchford's invention relates to certain improvements in these pillow blocks, and consists of a means for adjusting the quarter beams of a pillow block with reference to the shaft by means of vertically moving wedges and thumb screws, which are so arranged that the cap of the pillow block can be taken off without allowing the shaft to lose its proper position. In this device the cap can be entirely removed without in any manner disturbing the shaft in its adjusting mechanism.

CLUTCH MECHANISM.—Michael Kraker, S. F. assignor of part interest to M. Israel and O. Schmidt, same place. No. 283,493. Dated Aug. 21, 1883. This invention relates to a means for applying power to sewing machines so that they may be set in motion from a continuously moving shafting, or stopped without interfering with the motion of said shaft; and it consists of a peculiar frictional attachment operating directly upon the needle driving shaft, and a mechanism by which it may be applied or disengaged instantly, and without the use of a treadle.

MASTS FOR ILLUMINATORS.—Piedrede Saisset, San Jose. No. 283,581. Dated Aug. 21, 1883. Considerable attention is now being directed toward the subject of lighting large areas from a single source. This can only be done by supporting the light at an elevation, and for this purpose posts and towers have been employed. The posts when constructed of a single piece are too heavy and too expensive, and if made of several sections are not strong. The tower is too costly. The object of this invention is to provide a light and cheap mast having great strength and rigidity. It consists in the novel construction of the mast, and in the application of certain illuminating devices—such as electric lamps. The mast is hollow and peculiar means are adopted for weighting the base.

STEP LADDER.—Edward A. Shumway, Walnut Creek, Contra Costa Co., Cal. No. 283,524. Dated August 21, 1883. In this step ladder the step rails and rear standards are united at or near their upper ends by means of a curved depression formed in one and a corresponding projection upon the other, formed on the arc of a circle, and united by straps or belts at their common center. Strap joints and projecting lugs limit the amount of separation of the feet.

AUTOMATIC CUT OFF FOR ENGINES.—John B. Pitchford, S. F. No. 283,656. Dated Aug. 21, 1883. This invention relates to certain improvements in steam engines, and refers more especially to the valve gear and a cut-off mechanism which is applied thereto. A detailed description would be difficult to give without the aid of engravings.

NUT LOCK.—Edwin Odell, Elko, Nev. No. 283,505. Dated August 21, 1883. This nut lock consists in a nut having a spring pawl or pin adapted to engage with a washer having depressions on one side to receive the pin, and projections on the other side, whereby it is secured to the bed plate, the head of said pin being supported by a small perforated plate.

INVALID'S SETTEE.—John Rodgers, S. F. No. 283,515. Dated August 21, 1883. This invention relates to an invalid's settee for the use of those afflicted with disorders requiring injections. It consists of a settee, or frame, having a sliding or removable top, a perforated basin, or seat rest, and a peculiar sliding box or receptacle arranged in a convenient manner.

CYLINDER FOR THRASHERS.—Andrew G. Stewart, Oakland, Alameda Co., Cal. No. 283,529. Dated August 21, 1883. This improvement in thrashing machine cylinders consists of a combination of devices and arrangement of parts. It refers more particularly to the method of securing the teeth and the tooth-holding bars.

THE NEW POSTAGE STAMP.—The new design for the two-cent stamp is the head of Washington in profile, from Houdon's bust, placed on a plain tablet. Above the oval surrounding the head are the words, "United States Postage," and underneath the tablet are the words, "Two Cents." The stamps will be printed in metallic red. The embossed stamps on the two-cent envelopes will also bear the head of Washington. A four-cent denomination of stamps and envelopes, to cover double postage under the new rate, will also be issued. The design embraces the head of Jackson, similar to that on the present two-cent stamps and envelopes. The schedule of prices of stamped envelopes has been revised. Size No. 4½ (commercial size and commonly used by business men) will cost as follows, including if desired the name (excluding business employment) and postoffice address of persons ordering, together with a request to return, printed upon them, when ordered in quantities of 500 or more: 1,000 envelopes $22.20; 500, $11.10; 250, $5.55; 100. $2.22; 50. $1.11; 25, 56 cents; 10, 23 cents; 5, 12 cents; 4, 9 cents; 3, 7 cents; 2, 5 cents; 1, 3 cents. The new two-cent stamps or stamped envelopes will not be put on sale by Postmasters before October 1st. The two and three-cent stamps now in use will continue valid, and must be accepted in payment of postage whenever offered in appropriate amounts.

AH YOUNG, the Chinese Consul at New York, has had placed in the hands of every Chinese resident, a copy of his first official proclamation. He warns his fellow-countrymen against transgressing the municipal laws, and cautions them especially against lawsuits, gambling and opium smoking.

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OFFICIAL estimates of wheat and other crops in Russia show the yield to be generally satisfactory.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $4 a year, in advance. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times,) by turning a leaf.

INFORMATION is wanted at this office of one Joseph Craig, formerly of Cass county, Illinois, who came to California in 1849.

GOOD TRAMS IN OAKLAND can be had at the City Hall Stables, No. 514 Fourteenth street, west of the City Hall.

The Denver Mining Exposition.

The mineral exposition at Denver does not by any means seem to have been as successful as that of last summer. Then there were plenty of exhibits and many visitors. Still there were various complaints at the time, and the whole management was not as satisfactory as it might have been. This year there is open rebellion, and commissioners of some of the Territories have endeavored to withdraw the exhibits. Arizona, Montana, and we believe New Mexico, tried to take away their minerals after placing them on exhibition, but the commissioners or managers refused to allow this, claiming that it was agreed nothing should be removed until the close of the exhibition, as is usual in such cases. In the case of the Arizona exhibit, the matter has been taken before the courts.

The complaint of poor attendance seems well founded. Montana's commissioners telegraphed to the Governor of that Territory: "The Denver exposition is henceforth an assured failure, there being no attendance." Some of the Denver papers uphold the affair; others condemn it. One paper says it is a private scheme managed by private parties, and is in no sense connected with the city of Denver. The squabble yet continues, and it is hardly probable that a similar exhibition will ever be attempted again. If it is, there will be difficulty in getting the assistance of other States and Territories, unless it is made very clear that the proper parties have the management of the affair. It is rather hard on exhibitors who take the trouble to collect and bring a fine lot of articles to be seen, to have no one come and see them.

Cheap Ore Pulverizer.

There is for sale in this city, by I. A. Heald, American Machine and Model Works, 111 and 113 First St., a Rutherford Pulverizer, an improved revolving barrel crusher, which was only used a few times and is as good as new. It will be sold very much below cost, and miners who are in need of such an appliance for a small mine will do well to make inquiries concerning it. It is suitable for a pulverizing mill for powder or other substances. Reference as to above can be had upon applying to this office.

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Full information will be given and sent on application to the Secretary, 31 Post Street.

P. B. CORNWALL, President.

J. H. CULVER, Secretary.

DEPARTMENT NO 9—PROBATE.—IN THE Superior Court in and for the City and County of San Francisco, State of California. In the matter of the estate of ROSEMOND GREENWOOD, deceased.

Notice is hereby given, that Friday, the 28th day of September, A. D. 1883, at 10 o'clock, A. M. of said day, and the court-room of said Court, at the New City Hall, in the City and County of San Francisco, State of California, have been appointed as the time and place for proving the Will of said Rosemond Greenwood, deceased, and for hearing the application of George Spaulding and Mary Williams for the issuance to them of Letters Testamentary.

Dated, August 29th, A. D. 1883.

[SEAL.] WILLIAM T. SESNON, Clerk.

By E. J. CASEY, Deputy Clerk.

EDWARD W. BLANEY, Attorney for Petitioners.

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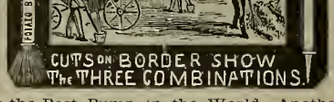
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Grass Valley, Cal.

More Legal Nonsense.

Mr. Dods, who despoiled the Oakland treasury in order that he might have material for private speculations, has taken up his residence in the State prison for five years—so the sentence says. But this righteous judgment is, it is reported, to be imperiled because Mr. Dods' lawyer has a grand theory of innocence upon which he can elevate Mr. Dods to a higher court. This lawyer appeals in this strain. Mr. Dods did not intend to steal the money; he expected to replace it; he was infatuated, and desperate in his speculation, and his intention was not to steal. Now, in the intent to commit the crime lies the essence of the guilt, and as Mr. Dods' intention was good, or at least not bad, he cannot be guilty as charged.

This is the lofty logic upon which the case is to be appealed to the Supreme Court. Of course, it is all nonsense. Probably very few of the thousands of embezzlers and defrauders who have abused public and private trusts have intended to steal, but nevertheless, the money has been converted to private uses, the trust has been outraged and the culprits are guilty, and deserve the full legal penalty for their crimes.

Intentions are well enough in their way. Even good intentions serve some purpose—they say that hell is paved with them. But good intentions are not strong enough to lift a poor, miserable thief out of the stocks because he stole to meet his pressing needs; nor should good intentions free from guilt one who fritters away the public funds in private speculations. We hope the Supreme Court will sit down quickly and very heavily upon the counsel of Mr. Dods, and that Mr. Dods himself shall remain in durance until he have time to consider how strange it is that a man with such innocent intentions could be so great a rascal.

San Francisco Metal Market.

(WHOLESALE.)

THURSDAY, Aug. 30, 1883.

ANTIMONY. Per pound	14 @	15
IRON. American Pig, soft, ton	30 00 @	
Scotch Pig, ton	26 00 @	27 00
American White Pig, ton	00	
Oregon Pig, ton	00	
Clipper Gap, Nos 1 to 4	00	
Refined Bar	4 @	
Horseshoes, keg	5 50 @	
Nail Rod	7½@	
Norway, according to thickness	8@	7
STEEL. English Cast, lb	16 @	25
Black Diamond, ordinary sizes	14 @	
Drill	15 @	16
Machinery	12 @	14
COPPER. Ingot	22 @	
Sheet	31 @	35
Sheeting, Canned, 14x48	22 @	23
Nails	17 @	
Bolt	31 @	
Old	8 @	
Bar	@	
Cement, 100 lbs	15@	
LEAD. Pig	5 @	
Bar	7 @	
Pipe	8 @	
Sheet	9 @	
Shot, discount 10 on 500 bags. Drop, ₱ bag	2 10 @	
Buck, ₱ bag	2 30 @	
Chilled, do	2 50 @	
TIN PLATES. Charcoal	7 55 @	
Coke	5 50 @	5 75
Banca Tin	25 00 @	
Australian	25 00 @	
I. C. Charcoal Roofing, 14x20	6 50 @	6 80
ZINC. By the cask	12 @	
Sheet, 7x3 ft, 7 to 10 lb, less the cask	20 @	
NAILS. Assorted sizes	3 30 @	4 75
QUICKSILVER. By the flask	35@	
Flasks, new	1 05 @	
Flasks, old	85 @	

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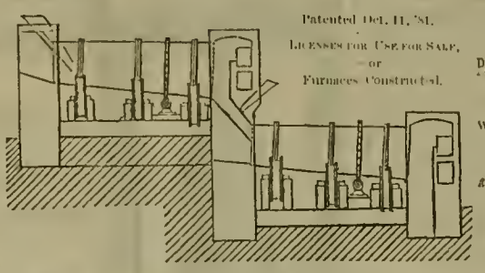
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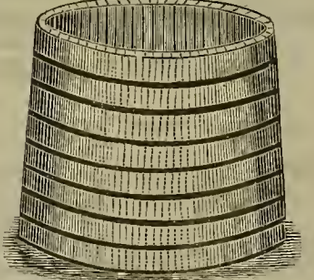
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DIVIDEND NOTICE.

OFFICE OF THE
Standard Consolidated Mining Company.
San Francisco, August 2, 1883.

At a meeting of the Board of Directors of the above named company held this day, Dividend No. 57, of twenty-five cents (25c.) per share, was declared, payable MONDAY, Aug. 13, 1883, at the Farmers' Loan and Trust Company, in New York, or at the office in this city.

WILLIAM WILLIS, Secretary.

OFFICE—Room No. 29, Nevada block, No. 309 Montgomery street, San Francisco, Cal.

ASSESSMENT NOTICE.

Seaton Gold Mining Company.—Location of principal place of business, San Francisco, California; location of works, Drytown, Amador county, Cal.

NOTICE is hereby given that at a meeting of the Board of Directors, held on the 31st day of July, 1883, an assessment (No. 3) of eight cents (8c.) per share was levied upon the capital stock of this corporation, payable immediately in United States gold coin, to the Secretary at the office of the Company, Room 6, 528 California St., San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 5th day of September, 1883, will be delinquent and advertised for sale, at public auction, and unless payment is made before, will be sold on Thursday, the 27th day of September, 1883, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

A. MARTIN, Secretary.

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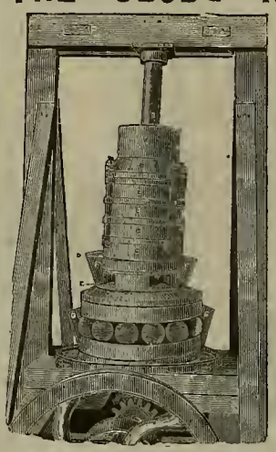
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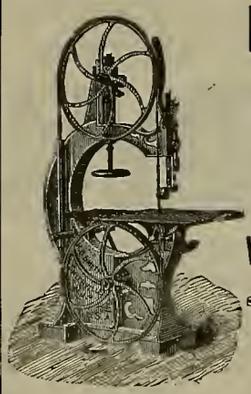
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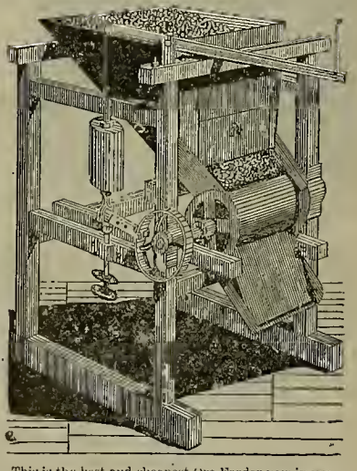
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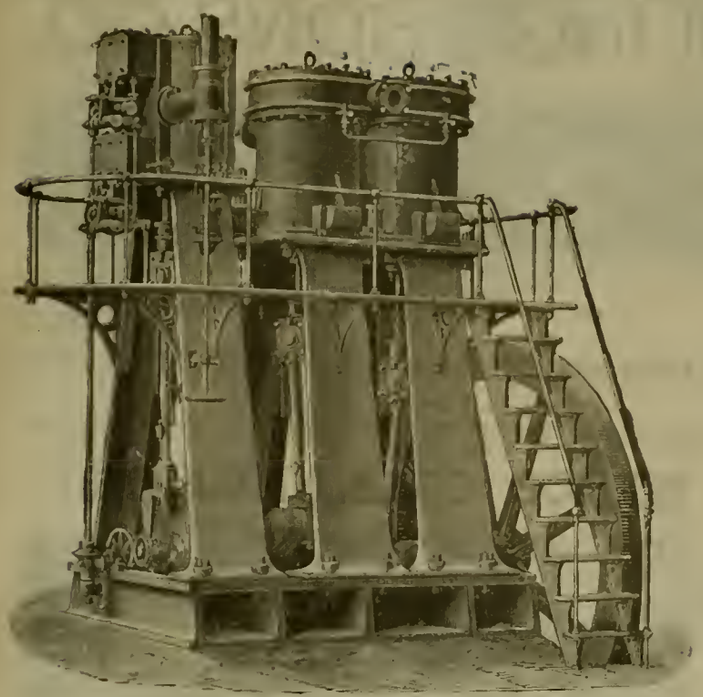
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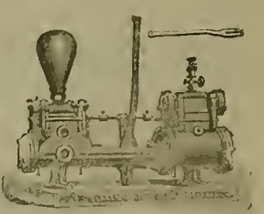


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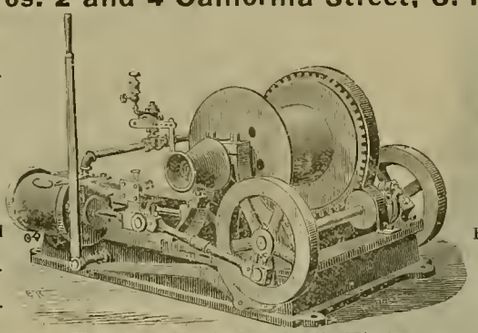


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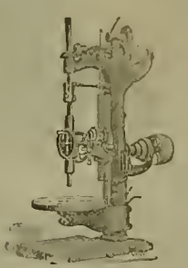




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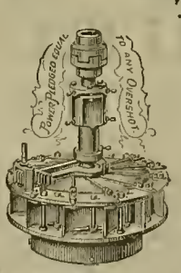
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The "Old Reliable,"

With Important Improvements, making it the

MOST PERFECT TURBINE NOW IN USE,



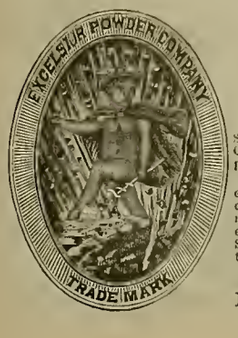
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The powder is put up in cartridges of any size to suit the consumer, and is exploded in the same manner as all other high explosives; that is, by means of cap and fuse, or by electricity. It is not claimed for this powder that it is a non-explosive, or safer than other nitro-glycerine powder. All powder, and especially nitro-glycerine powder, should be handled carefully. The EXCELSIOR POWDER is as safe, and for strength far surpasses any other powder on the market. Address all orders to

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AMALGAMATING PLATES,

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Manufacturers of

WIRE ROPE and WIRE

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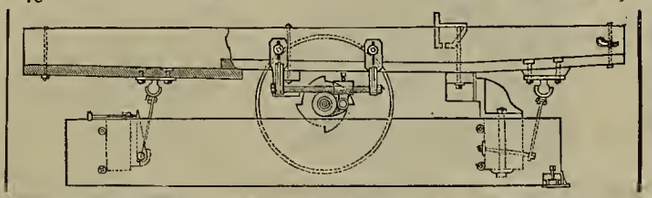
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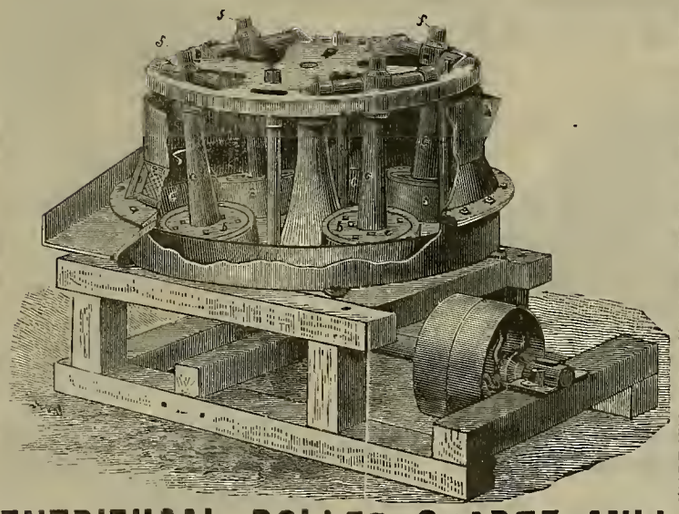
CONCENTRATOR

This machine requires less power, less care or attention, and is less liable to get out of repair than any concentrator now in use. All of which any practical miner will comprehend when seeing it in operation.

The wear and tear is nominal, and the construction so simple that any miner can put it up and run it; and the low price brings it within the reach of all mill men, as it will save enough to pay for itself in any mill in a very short time. One machine will concentrate the tailings from a five-stamp battery.

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CAPACITY AND DURABILITY GUARANTEED.



MILLS ERECTED WITH ALL APPLIANCES COMPLETE.

CENTRIFUGAL ROLLER QUARTZ MILL!

After running one of these mills on the Whidden mine, in El Dorado county, over four months, and thoroughly testing its capacity and durability, I am prepared to offer it to the mining public, and claim for it the following advantages over the drop stamp mill:

1. The cost of same capacity is not more than one-half that of stamps.
2. Freight to mine one-fourth that of stamps.
3. Cost of erection at mine one-tenth that of stamps.
4. It runs with one-third the power per ton of ore crushed.
5. The wear is less than that of stamps.
6. The wearing parts are easily duplicated.
7. It has a much better discharge, and leaves the pulp in better condition for concentrating.
8. It is a better Amalgamator, saving fully nine-tenths of the gold in the mill; the balance can be saved on plates in the usual manner.
9. It is continually crushing; not like the stamp, using power to suspend it in air ninety-nine one-hundredths of the time, and the balance making a thundering noise, and accomplishing *comparatively* small results. It is as far in advance of the stamp mill as the present method of making flour with improved rolls is over the Indian's mode of crushing corn in a stone mortar.

F. A. HUNTINGTON, ESQ.—DEAR SIR: Your Centrifugal Roller Quartz Mill has run on the Whidden Gold Mining Company's property, at Shingle Springs, El Dorado county, Cal., about four months, and it did good and satisfactory work; a greater portion of gold remaining in the mill than in a stamp battery.

FRED. JONES, Supt.

SHINGLE MACHINES AND SAWMILL MACHINERY OF EVERY DESCRIPTION.

L. M. STARR G. H. MALTER

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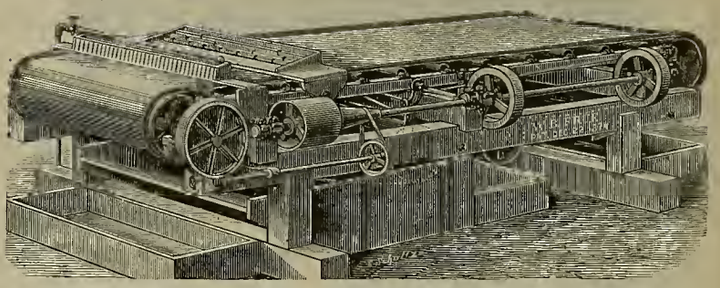
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$1,000 CHALLENGE!



THE FRUE ORE CONCENTRATOR,

—OR—

VANNING MACHINE.

Over 400 are now in use, giving entire satisfaction. Saves from 40 to 100 per cent. more than any other Concentrator in use, and concentrations are clean from the first working. The wear and tear are merely nominal.

A machine can be seen in working order, and ready to make tests, at the office of Hinckley, Spiers & Hayes, 220 Fremont Street.

To those intending to manufacturs or purchass the so-called "Triumph" Concentrator, we herewith stats:

That legal advice has been given that *all shaking motion* applied to an *endless traveling* belt used for concentration of ores is an infringement on patents held and owned by the Frue Vanning Machine Company

That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.

That the patent laws make *users* of infringements responsible as well as makers, and the public is therefore warned that there is considerable risk in purchasing any end-shake machine until our various patents have been decided.

That if there are those who for any reason prefer an end-shake machine, we can manufacture and sell to such machine of that description, as efficient as the Triumph, and at a lower price, and no liability for infringement will then be incurred by the purchaser.

That we shall protect ourselves against any one making, selling or using any machine infringing any of our patents. Patented July 9, 1867; May 4, 1869; Dec. 22, 1874; Sept. 2, 1879; April 27, 1880. Patents applied for.

That we are, and have been, ready at any time, to make a competitive trial against the Triumph, or any other machine, for stakes of $1,000.

ADAMS & CARTER, Agents Frue Vanning Machine Company,

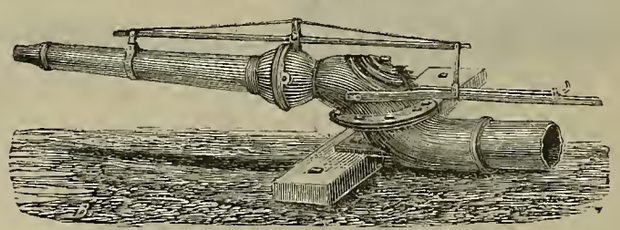
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Nov. 6, 1882.

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—OF—

HYDRAULIC GIANT



We call the attention of those using or interested in Hydraulic Mining Machinery to the above cut of an improved form of Hydraulic Giant, in which it will be observed that the Deflector and heavy weighting rear part are abolished and a lever attachment, working with a ratchet and pawl substituted, by which the pipeman, standing in the rear of the machine, has, without danger of "bucking," full control of the direction and effect of the stream. In an action in the U. S. Circuit Court, entitled F. H. Fisher and Joshua Hendy vs. Richard Hoskins et al. of the Marysville Foundry, a permanent injunction has recently been ordered against all persons manufacturing or using any form of Hydraulic Machine having the equivalents of the above.

All of the usual sizes are manufactured (under an exclusive right) and for sale at reduced prices by JOSHUA HENDY, at the-

JOSHUA HENDY MACHINE WORKS,

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FROM 1-4 TO 10,000 lbs. WEIGHT.

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15,000 Crank Shafts and 10,000 Gear Wheels of this Steel now running prove its superiority over other Steel Castings.
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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, SEPTEMBER 8, 1883.

VOLUME XLVII
Number 10.

Working Silver Ores.

At the mill in Tuscarora, Nevada, where the ore from the Independence and Navajo mines is worked, some good work was done during the past year considering the class of ore. They dry, crush and roast with chloridizing furnaces, on the Nevin combination plan. The Superintendent of the Navajo in his annual report gives the following results:

The mill run covers a period of 321 days, of which the actual running time was 309½ days; showing a loss of 11½ days, including all stoppages. Milled 3,955 3 5 tons of Navajo ore, and 282½ tons of custom ore, making an average crushing of 13¾ tons of ore per diem. The average battery pulp assay of the ore from the Navajo mine was $199.40 per ton, and was worked to 92 3 5 per cent of the battery assay; custom ore averaged $332.10 per ton, and was worked to 92 per cent.

Shipped bullion on customers' account to the amount of $64,863.42. On Navajo account, to the Bank of California, from Navajo ore, $730,379.38; from custom ore, $21,549.37; from profits on custom ore, $2,206.58, making a total production in bullion of $818,898.75 (assay value) from the 21st of July, 1882, to the 7th of June, 1883; of which amount $720,874.58 was shipped during the fiscal year on company account.

The quantity of ore crushed for a battery of 10 stamps, and the per centago to which it was worked, has been unusually satisfactory. The condition of the mill for the last half of the run added materially to the cost of reduction, and the repairs required on the engine necessitated a suspension of work for a considerable length of time. The mill is now being repaired, and when completed will materially reduce the cost of milling.

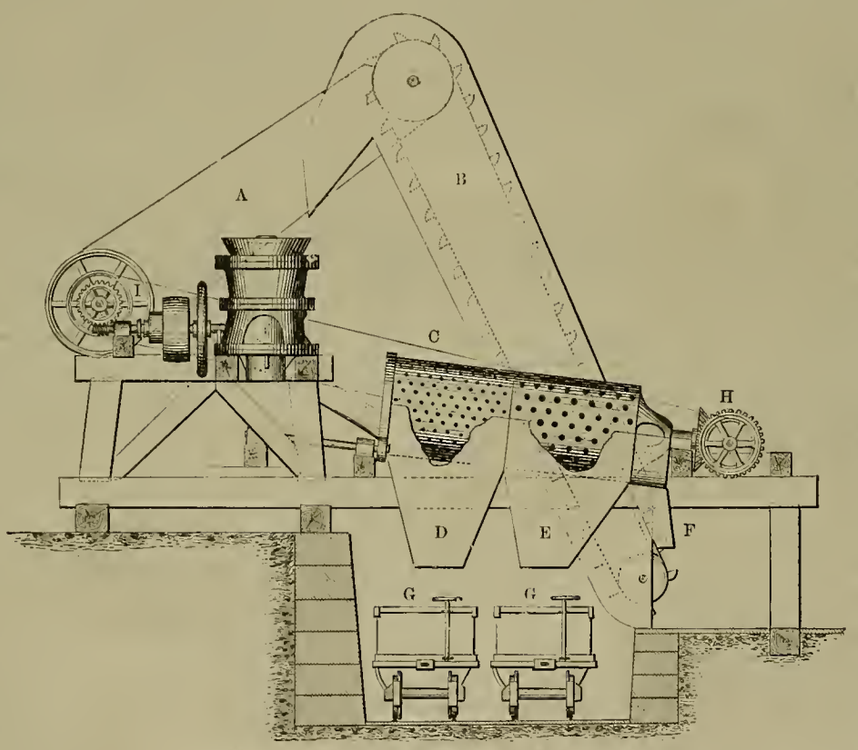
The Superintendent of the Independence reports as follows:

During the past year we have extracted and milled 267 17 20 tons of ore, averaging $322.88 per ton. The Navajo Mining Co. having the mill in use, milled our ore for us at the rate of $25 per ton, net cost, and worked it to ninety-three per cent of the battery assay. Settlement was made at that percentage. We rerceeived and shipped to the Anglo Bank of California bullion to the amount of $62,910.45, and after deducting bullion discount on the balance of the bullion, and paying for the milling of the ore, we received from the Navajo company in coin $8,472.07. The ore seam averaged very small, but the grade of ore ran unusually high. The ore was extracted above the 300 foot level, and considerable work has been done in the same locality without discovering any more ore.

Heretofore nickel ore containing ten per cent of nickel has been considered rich, even when contaminated by the presence of much cobalt, which is almost universally present in nickel ores. The recently discovered ore in Churchill county, Nev., averages more than thirty per cent of pure nickel, even by the carload, and is free from deloterious impurities. The ore consists of a mixture of the arsenate and arsenide of nickel.

The Comet Crusher.

The engraving on this page represents a complete crushing plant of the Comet rock and ore crusher, for preparing railroad ballast, street macadam, etc. A is the Comet crushor set up on a good framework, from which the crushed stone falls into the revolving screen C, provided with perforated screens or wire cloth of two or more sizes, as desired. The sizes required pass by spouts D and E into railway cars, G G, below. Pieces too large pass out through the spout F into elevator B, and are returned to the crusher to be recrushed. This machine crushes without any jar or shock. The discharge is large, so there is no chance of clogging. The machines are made in five sizes, to crush from four to sixty tons per hour. The plant is one of the many which Fraser & Chalmers, of Chicago, can submit, who are prepared to make economical arrangements for all kinds of crushing.



CRUSHING PLANT WITH COMET ORE CRUSHER.

The new postal-note system of transmitting money went into operation Monday. These notes are used for sums less than $5, and are a valuable adjunct to the money-order system. There were 16 issued in San Francisco on Monday, several being procured for curiosity, the first one issued being for the amount of one cent, to be drawn on the Oakland postoffice. Most of the others were also of very small denominations.

The Union Pacific company are now making a preliminary survey for a branch narrow-gauge from Bear canyon, on the Utah Northern railway, to the western boundary of the National park. The grade will be easy, and the distance will be about seventy-five miles from Bear canyon. All surveys are to be completed this fall. The work will be finished in time to secure tourist travel next season.

The Mechanics' Fair.

The eighteenth Industrial Exhibition of the Mechanics' Institute will open at the Pavilion on Tuesday next, and continue until October 13th. The exhibition will be of the usual nature. This year premiums will be awarded. These consist of gold, silver and bronze medals and diplomas, and will be given for the following classes: Steam engines, boilers and appliances; hydraulic machinery and steam pumps; machinists' tools and metal working machinery; wood-working machinery; printing and miscellaneous machinery; mining machinery and appliances; laundry machinery; fire apparatus and appliances; marine; sewing, braiding, knitting machines and looms; agricultural machinery; iron, steel and lead manufactured products; cooking, heating and ventilating; safes and locks; cutlery and edge tools; grates and mantels; brass works and plumbers' tools; carpenters', joiners' and stair builders' work; musical instruments; vehicles, furniture and upholstery; woodenware; boots, leather and rubber goods; hemp, cordage, paper, furs and hair; woolen dress goods, cotton, etc.; furnishing goods; dresses, cloaks and millinery; tobacco; chemical and pharmaceutical products; geology, mineralogy, zoology, and botany; groceries, flour, etc.; wines and brandies; silver plated ware; scientific apparatus; surgical and dental appliances; needlework, patterns, etc.; paintings, ceramic art, sculpture, statuary and carving; engravings and drawings, photography, plants, trees, flowers, and fruit.

The progress of distinguished foreign tourists in America is watched in London with great interest, and in place of Parliamentary proceedings, the nowspapers are full of American affairs—emigration, natural resources, scenery and social conditions.

Lower California Copper.

One of the most intelligent of the ex-superintendents of the Lake Superior copper mines states that he believes that there is but one mine in that section that produces copper for 15 cents per pound. Nearly all of the copper mines in Arizona are able to turn off their product at a cost not exceeding 9 cents per pound, while one or two are able to do so for 8 cents. The copper mines in Baja, California and Mexico, it is stated, can place their copper ready for shipping at 6 cents per pound, and even for 5 cents. Labor in Arizona is from $3 to $5 per day. Coke $42 per ton. Provisions and groceries high. Freights to and from San Francisco very high. In Baja California, good Indian labor is $1.25 per day; natives $1 to $2.50, and all board themselves. Coke costs $24 per ton. Freight to and from the East, and Europe, only $12 per ton, as against much higher rates in Arizona and New Mexico. From these figures it is very evident that the development of the great copper belt on the Pacific coast of northwestern Mexico, which is over 600 miles in length, and from 30 to 50 miles wide, must bring about a great change in the price of copper, not only in the United States, but also in Europe. A company of New York capitalists are now building extensive reduction works on the coast a few miles below the Real del Castillo. They expect to put their copper on board vessels in their harbor at a good profit for 5 cents per pound. The ore from which this copper will be taken, contains about $8 in gold and $15 in silver per ton, one per cent of nickel, making the product just that much more valuable to the producers and purchasers.

It can but be a question of a little time when the price of copper must be further materially reduced, and the production of it become one of Mexico's most valuable industries. It is a question of general interest to all. This great Mexican copper belt, which is believed to contain many thousand good copper and silver mines, lies adjacent to the Pacific ocean for more than 600 miles, many of the best mines being only from 2 to 10 miles from good vessel landings.

Steel manufactured in San Francisco from the iron taken from the copper mines and iron deposits in the same mineral belt, is found in quality and temper to be superior to any ever produced in the United States. Many of the copper ores are self-fluxing, and when they are not, iron, limestone and spar are so convenient that there is no expense to flux the ores in the smelter.

A Single Locomotive is now being built in the Sacramento car shops of the Central Pacific which will be larger than any ever before built in the world. The engine will have five pair of driving wheels. The weight of the engine will be seventy-three tons; weight on drivers, sixty-four tons; weight of tender, over twenty-five tons; weight of engine and tender when fully equipped for the road, 105 tons. The length of engine and tender will be sixty-five feet and five inches.

CORRESPONDENCE.

Notes from New Mexico.

[From our Traveling Correspondent.]

New Mexico is just beginning to find out that she too has a birthday to celebrate. She now begins to know that she has arrived well into her teens, and can now enter society, and her grave seniors, after due deliberation, concluded to call a council and determine what that celebration should be and what it should be named, and announced to the world. The records of all the five Yankee celebrations, "Bunker Hill," "Boston Tea Party" and "Plymouth Rock," were received with a lively interest, especially to the Yankee descendants now living here, but did not seem so important to the Spanish and Indian portion of the great council. There seemed to be a lack of enthusiasm, and a lack of the proper alloy to cause these three races to fuse properly together and form one common interest, which alone could insure success. The Pueblo or village Indian is industrious, and yet quite willing to join in a general meeting and celebrate his first acquaintance with the Spanish visitors.

The Spanish were reminded that this was an occasion to see themselves placed on the car of progress, leading off with St. Augustine of Florida, the old Virginia Colony and Plymouth Rockers long years behind them. "Besides," rejoined one, as if just awakened from sleep, "it is highly fitting that New Mexico should now be heard from as the grand central point of the nation, as well as the point where we can date the first white settlement back to 1550, 333 years ago!" After a few rousing suggestions, it was unanimously resolved to celebrate in a manner becoming and appropriate to their size or area, age, wealth and position, and so as to fully do honor to their three distinct civilizations, who now reside harmoniously in this great Territory.

The various committees and officials being carefully elected and appointed, the work was entered into in earnest, and resulted in announcing

"The Santa Fe Tertio-Millennial Anniversary,

Character Celebration and Industrial Exhibition opens July 2d and closes Aug. 3d, on 33d day of 333d year." The undertaking was gigantic, as any one can judge who has any knowledge of these dissimilar elements. The descendants of the old Aztecs, the Pueblo Indians, the various grades of Spanish-speaking settlers, now slightly in the majority, many of them very poor and a few quite wealthy; and all to be blended and sandwiched with a Jonathan Yankee minority to superintend the whole affair and make it really all distinctively an American show. Yes, American—in the sense of progresion, as contrasted with "*Esta Buena*," in the sense of don't trouble to better it—*satisfied*.

I dare not go on to expand this idea of the meaning of American in its good sense; but when an aged white frontier teacher and preacher had made a short discourse both in American and Spanish in the great audience-room of the exhibition, to the effect that, besides the teaching of science, there was need of a teaching of the heart, or conscience, that would govern men where they would not fear being reached by the arm of the civil law; this discourse was plain and convincing as the only line of progressive civilization. He was followed by an

Aged Chief of the Utes,

Who spoke earnestly and eloquently, and indorsed that which he had heard in the Spanish version of the former speech, and desired that his children should be taught both in our business and our religious education.

Turning to his little son nine years old, he brought him forward on the stage and said, "My boy now attends your school, and is already able to read and write quite well." The chief expressed much satisfaction in seeing his boy clothed and treated as an American lad.

When the interpreter had finished the interpretation of the chief's speech, he was urged to say a word or two himself, and he gave a very affecting narration of how this chief and his warriors there present had exchanged bullets with our soldiers under this interpreter, and left their marks on each other twenty years ago; and how this same chief, and these warriors had since bravely saved whites from being killed by hostile Indian foes. The narration was simple and touching, and interested all, and left the impression very strong that peace, prosperity, and progression are radical ideas in our true Americanism.

Santa Fe

(Holy Faith) town was considered the proper town for such a celebration; the capital of of the Territory, and amply supplied with public grounds and buildings for the exhibit, and also ample city room for many thousands of visitors—Santa Fe, a name so familiar to every one from Maine to San Francisco, as a prominent old trading post and landmark familiar to many brave frontier traders long before the days of '49. The romantic, and hilly environment of the old city, that enjoys the healthy elevation of 7,000 feet, with all the marks, signs, and collections of past ages added to the modern improvements that have been recently added, made it emphatically the place for this immense undertaking of a grand historical spectacular show which could not have been made a success in any other place. The programme was laid out for each day, and printed on a large pocket folder, similar to those used for railroad maps and time tables. It was printed on tri-colored and illuminated embellishments. The programme for the first day opened with an artillery salute, grand military and civic parade; opening ceremonies and address by Gov. L. A. Sheldon; also an historical oration and other addresses by distinguished public speakers, music, etc. Afternoon, Indian races, dances and games in the arena.

Each day had a prescribed and varied programme, historical processions in characters, speeches in American, Spanish and Indian, poems, music, races, fireworks, competitive drills in military tactics, military balls and banquets, Spanish balls and fandangos, native Mexican dancing and juggling, aztec dances of different forms, in which both Indians and Mexicans joined; all kinds of comic races and amusing customs were brought into the programme to insure a lively interest in all the various classes in attendance.

But one great feature of the exposition was the great collection of all the

Relics of the Past Ages

To contrast with their substitutes of to-day in every department, tools, machinery and implements. There were the Navajoes spinning and weaving their heavy blankets on a loom very rude, which had been in use 200 years.

Near by was an Italian woman making by hand beautiful figured lace trimmings.

The Spanish jeweler was showing his great skill in making fine filigree silver work, while in the adjoining shed the Indians would be busying themselves in making buckskin leggings, fringing and decking them off with some crude ornaments, and others working head and neck ornaments. But the great point and object of the exhibit was to let the mineral wealth of New Mexico be made apparent to the world, and also its easy accessibility by railroads now completed, and others chartered and surveyed. One remarked, "This whole show is only an advertisement." Granting the correctness of his statement, it was a noble and praiseworthy exhibit of the great resources of a large Territory containing 121,201 square miles, an area almost equal to three times that of New York State, and greater than New York added to all the New England States. This great central Territory is now divided into 12 counties with an average area of over 10,000 square miles each. The climate is temperate, and being elevated from 5,000 to 7,000 feet, has a very pure and healthful atmosphere.

On entering the great hall where the minerals were displayed (a structure very long and wide), the first on the right is the attractive sign of

Socorro County.

This county occupies a central position in the Territory, on the Rio Grande river. It is a pleasant and healthy county, producing fruits—pear, apple, apricot and peaches—with small attention. Also, the Mission grape is a success, as are the principal garden vegetables, and corn, wheat and oats. It now enjoys the advantages of the Atchison, Topeka and Santa Fe railroad running through it, and joining the S. P. R. R. at Deming, giving it a new life and impulse as a county, and evidence of this great impulse was to be seen in ample exhibits of its products. Some sheaves of oats, wheat and barley were there to speak loud for the staff of life. Previous to the advent of the railroad to the county they used to export grain and flour to western Louisiana, Arizona and Mexico. Now they have local purchasers, and more home consumption than they can supply. The Socorro exhibit was a mineral exhibit of great merit.

As the Commissioner, Prof. Chas. Lougemare, remarked, "these samples represent 382 mines from 47 mining districts," and they were not thrown carelessly up, but neatly arranged and labeled; and some of the mines had carefully drawn diagrams showing all their underground working; list of working assays of ores; the district, officers, etc., of that mine; sometimes adding how many tons of ore on the dump, or as the Cabinet mine put it, "Seventy-five thousand tons of ore in sight. Owned by Rio Grande Mining Association of Minnesota."

These various samples were a larger portion of them smelting ores, containing gold and silver, or silver alone. One sample of magnetic iron ore carrying tin, lead, silver and copper; its magnetic iron was shown by its holding a large number of nails attached to it and to each other. Fine samples of fire clay, for brick and furnace linings; coal of fine quality for coke and railroad use.

"Salt 22,000 acres in a body, 85 miles southwest of Socorro," favorably represented by fine specimens of mottled marble from 3 miles east of Socorro City.

There were specimens of ores from Black range, west of Socorro City, worth $15,000 to the ton.

One little sample from Kelley mine weighing 975 pounds, carb lead ore carrying 9 ounces of silver to the ton—large vein. From what was here exhibited by a very able representative of New Mexico, but especially commissioned to exhibit this county, it is evident that this one county has plenty of resources for wealth, and if half developed, ample for one whole State. Socorro county can furnish some mining

Claims of Sensational Richness,

But their greater merit seems to be in the fact that they have abundance of large true fissure veins, and evenly diffused pay, and lack none of the requisites in fluxing materials for their proper workings.

The Great Republic in Black range claims a vein of 12 feet, carrying 200 ounces of silver with one to three ounces of gold per ton. A neighbor to this mine is the Ivanhoe, a 7-foot ledge of great reputed richness, more noted from the fact that Col. R. G. Ingersoll was reported to have lost $50,000 in this stock, while it is said that it would take more than double that amount to buy that same stock.

Some distant speculator might lose his money on the best mine ever opened and the mine not be in any way responsible for his reputed or real loss. Passing to the opposite side,

Santa Fe County

Claims a recognition by a huge pyramid of anthracite coal with a grand arch built of coal and coke. Her display, consisted of gold, silver, copper, lead and iron ores, petrified tree sections, together with piles of metals and lead bars from Los Cerrillos works. The fire clays and coal exhibits were from the same location. This exhibit, like many others, was trusted mainly to speak for itself, and seemed to say, "Visitor, as you see me, so judge me," and pass on to see

Taos County,

That also gives a creditable showing of varied minerals. And right beside them stand about a dozen sacks filled with miners' beans, flour, wheat, oats, etc., to show that Taos can feed its miners from its own agricultural resources.

Lincoln County,

The largest and newest county, located in southeast corner of the Territory, and yet remote from railroad, is said to be one of the best watered and best grazing tracts in the Territory. There is much flowing water, and plenty of places where wells from four to forty feet in depth give abundance of good water. Through this county from north to south runs a wide mineral belt, carrying every variety of precious metals. Beginning on the north, we find copper and galena ores with gold and silver; further to the south, in the Hickorea range, are rich placer diggings, but little developed for lack of water.

About the center is the camp of the White Oaks, where are free gold ores. The ore is a peculiar kind, a dark, porphyry granite. In the same region are some thousands of acres of gold fields, the principal claimants for which are Gould & Huntington, who have somewhat proved the value of same by development. Twelve miles further south in the same belt begins the Nogal and White mountain ranges, also very rich in silver ores, and in the same range there is one lead of free gold ore very rich, on which there are now five different claims located.

The valleys in these ranges of mountains are all being located as ranches for raising vegetables, vineyards and orchards. Onions yield as high as 3,500 pounds to the acre, single ones weighing four pounds. The Pecos river, running southerly along the eastern portion of the county, is furnishing much good ranch land with water. The valley is fast being taken up by farmers and cattle ranchers. The larger portion of it is surveyed. Homestead and preemption claims are being made. The great wonder and astonishing feature of Lincoln county is that it has no land grants and no railroad sections to molest or make the settler afraid.

There is an Indian reservation for the home of a small remnant of Mescalero Apaches, with San Juan their chief and about 400 followers, all friendly. The population is about equally divided in Spanish and American speaking people. The county is divided also about equally in valley and mountain and hill lands. The county seat is Lincoln, in Sierra Capitan district. White Oak is the principal town in the district of the same name, 100 miles from railroad station of San Antonio, on the A. T. & S. F. railroad.

This county sent an able, pleasant and efficient commissioner with good showing for an infant county. His name has escaped me at this moment. I next step over to the booth of Grant county, away down on the border of old Mexico, and forms the southwest corner of New Mexico and neighbor to Arizona. The beautiful sign of the booth says

"Kingston,

"Grant county, N. M.," from which we infer that Kingston, the town of the famous Percha district, is a representative live mining center, and all doubt of this is dispelled when a careful inspection is made of her exhibits of fine ore specimens; her native copper; sheets of red oxide twenty-two inches long by twelve inches wide, and one-eighth of an inch thick. There were fine bars of copper from the Hanover and San Jose smelters. In these show cases were their hoss rich ores not safely trusted outside. We all wanted to feel of those samples. One fine one, labeled "Carbonate lead ore, value forty ounces of silver per ton, sixty-four per cent lead," is very good smelting ore.

As this hasty glance of only one district of a great mining county is entirely too brief to notice anything of its geological characteristics or any of its individual claims or developing enterprises, I can say to any interested that the Kingston (New Mexico) *Tribune* has issued a neat 50-page pamphlet descriptive of the mines of that district, which they offer to whoever sends them an address with a three-cent stamp to cover postage.

Donna Anna County,

Lying to the east of Grant county, and also joining Mexico on the south, gave some good exhibits of copper ores. The Bobtail mine, Hillshoro and others piled up gold, silver and copper ores of high assay value.

Sloan & Reed, brokers of Santa Fe, exhibited good specimens of mines of different localities. They are regarded as reliable business men and handle good properties,

The Atlantic and Pacific railroad, which runs from Albuquerque, N. M., through a portion of New Mexico and entirely across Arizona Territory on the 35° of latitude, gave a rare collection of fine specimens of rich Arizona ores in a heavy rustic trimmed show case. In this collection Mojave county made a bright showing of gold and silver, wire and silver moss specimens.

Outside the case they exhibited other minerals and coal from their own coal mines at Gallup. Also, petrifactions from the forest of petrified trees in Arizona, near the line of A. & P. railroad, and samples of corn and grain and other

Soil Products,

Making a very creditable display of the resources of the country passed over by their 565 miles of steel railway, which is now spiked across the Colorado river and opens direct route with S. P. R. R. to San Francisco through the noted Calico mining district. This by no means exhausts the mineral exhibit nor does even a fraction of justice to those noticed. Arizona was represented also in some rich specimens from Prescott in charge of F. M. Murphy, able Commissioner for Yavapai county to the Denver, Colorado, mining exposition. His collection was hard to equal, especially the varied types of rich copper ores.

Eastern visitors to the Santa Fe Exposition were much pleased to be able to see so

Many Tribes of Indians

There represented, exhibiting many of their games, ceremonies and customs, ancient and modern. The town of Santa Fe itself is an old curiosity shop in its ancient buildings and in its relics and historical landmarks. The new and modern town is growing right up in the midst of the old, and the contrast is very marked. The University of New Mexico is a modern brick structure, three stories high, nearly completed. The Catholics have large institutions here, as they also have in the other large towns of New Mexico. This reminds me of one exhibit I think worthy of mention, and that is the drawings by lead pencil from the

Indian School

At Albuquerque, under the superintendence of R. W. D. Bryan, aided by a very efficient force of teachers.

Each picture was signed by the name of the pupil who drew it, and how long time they had been in school. They were very creditable to both scholar and school. I visited the school, found about ninety scholars well cared for and seemingly happy, and learning very fast. The lady teachers are very skillful in teaching them to speak, spell, read and write a new language. They instruct in much besides the book studies; household duties, sewing and fancy work. The boys are training for farmers. The exposition could not show the rapid growth of mining and railroad towns, nor can I here but allude to it. There was a marked absence of mining machinery at the exposition, yet there was one hand power windlass for a mining shaft that for efficiency, cheapness and safety, is perhaps the boss of all the hand-power windlasses. It was invented by C. W. Baldwin, of Denver, Col.

A machine panner, or fine gold-saving machine, very ingeniously constructed and light for transportation, was exhibited by the inventor. Santa Fe made a great effort to interest and accommodate many visitors, and succeeded.

B. W. CROWELL.

Denver, Colorado, Aug. 15, 1883.

THE GREAT TACOMA GLACIER.—Senator Edmunds in speaking of his visit to the Great Tacoma Glacier, in Washington Territory, says: "I absolutely never believed there was anything in America comparable in grandeur to the scenery I have seen on my necessarily brief visit to Mount Tacoma. The access, thanks to the well-cut trails made by the engineer of the Northern Pacific railroad, is easy, and as I learned from Mr. Oakes, will be made as easy as a carriage road, or nearly, within a month from now. To express half of my admiration for the transcendent grandeur of every part of the scenery, and especially of the glacier, would be impossible. A more perfect glacier, in all the features found in such a phenomena, it would be impossible to find. Certainly, no Alpine glacier excels it in perfection, and yet as I was given to understand, it is the least, in point of size, of all that have been discovered on this mountain. I cannot help saying that I am thoroughly convinced that no resort in the United States will be so much sought after as this, when once people come to know that what men cross the Atlantic to see, can be seen in equal splendor, if not surpassed, at home.

TO QUOTE a phrase current among miners and prospectors, "When the Lord made the Upper Wood River country he had a superabundance of land, and to make room for it all he was obliged to set it up on edge." This leaves the trail from Sawtooth to Atlanta very steep over a mountain 8,900 feet above sea level, on the top of which blooms a well-watered garden of flowers of every color and perfume. The enchanting view, the wildness of the rough mountain below, the fallen trees laid away to their everlasting rest in beds of ferns and mosses, and the grand mountain peaks in the distance, give a beauty and strangeness to the spot such as can never be rivaled by the hand of man.

MECHANICAL PROGRESS.

The Rolling of Molten Metal.

We made a brief reference in these columns a few weeks since to a suggestion which had been made to roll molten metal. The *Iron Age* of a later date refers to the matter as follows:

One of the mechanical papers of this city, evidently more at home in matters pertaining to the lathe, planer and other appliances of the machine shop than in the department of metallurgy, remarks: "*Iron* notes a proposed rolling mill for rolling iron and steel, to be delivered to the rolls in a molten state, by which it is claimed it will be freed from gases. The rools are to be hollow, and a current of water passed through them to chill the surface of the metal. We should like to be told how molten iron can be rolled. —*Iron Age*.

Judging from this, and from the fact that the item which provoked our mechanical contemporary's criticism was extensively reproduced in different papers and considered as something entirely new, it would seem to have been lost sight of that a similar attempt was made some time ago by Sir Henry Bessemer. In the arrangement as brought out at that time, sheet metal was to be made directly from the converter by pouring the molten metal between two revolving rolls. So long as the supply of steel was properly maintained and the rolls worked freely without meeting any obstruction, a continuous sheet of metal of good quality was obtained, and the product, when worked up, was said to give very satisfactory results. However, it is by no means difficult to point out elements of weakness in the method, and to these it is probably due that the rolling of liquid metal never seemed to meet with much favor. Prominent among them is the item of a continuous supply, as it is clearly apparent that anything producing a check in the flow of metal would lead to a more or less complete dismantling of the whole train. The destructive action of the highly-heated metal upon the rolls, tending to produce rough surfaces, is another point of considerable importance, especially in turning out sheet metal, where irregularities, however slight, are necessarily fatal to good results. Another disadvantage is found in the difficulty of keeping the liquid metal free from such impurities as slag, etc., from the ladle, which, when worked into the sheet, would necessitate the cutting away of large portions, thus entailing considerable waste. Even in view of all these difficulties, however, the operation of rolling molten iron or steel is not impossible of execution, and it is to be hoped that our contemporary's remarks, which, we think, can scarcely be misinterpreted, will not be too firmly impressed upon its readers.

Ashes in Mortar.

Mr. J. A. Shinn has obtained a patent for the use of ashes in making mortar. It has been found that the fine portion of domestic ashes is capable of being converted, with a small proportion of lime, into a mortar having, when a month old, a tensile strength of from four to five times that of common sand and lime mortar, or about eighty pounds per square inch. Sand mortar a month old has a tensile strength of twenty pounds. Ashes and lime mixed as beton, gives a tensile strength of 140 pounds, and a crushing strength of over 1,100 pounds per square inch. It will thus be seen that, by utilizing the ashes for mortar, a large part of the expense of removal could be saved, together with the whole cost of procuring sand for that purpose, and at the same time a very superior article of mortar be produced. In consequence of the small quantity of lime required (ten per cent), it would be necessary to mix the mortar by machinery at a mill and deliver it ready for use. This practice prevails to a great extent in European cities on account of the superiority of milled over hand-made mortar.

Ash mortar has the additional advantages of resisting the action of water as soon as it has set (in from two to three days), and also the combined action of fire and water, the quantity of lime being so small and the chemical union with the ash so complete that the application of heat does not produce free oxide of lime, as in the case of sand mortar, and consequently does not swell when the water is applied to the heated mortar.

The weight of ash mortar is about one-half that of sand mortar when both are dry, and it works soft and smooth. Ash mortar forms, when set, a silicate of lime and alumina, and hardens uniformly throughout, like cement; while sand mortar, when set, is but an imperfect carbonate of lime, the sand furnishing the nucleus around which the carbonate forms. Ashes made under steam boilers, or in other fires where a high degree of heat is maintained, are not suitable for mortar, owing to the chemical change which takes place in the fire, the finest part of such ash, that found behind the bridge-wall of the boiler, being found to be of the same nature as the coarse clinker, having no special affinity for lime, and being only fit for combination with cement or plaster.

American Furniture Abroad.

American furniture, owing to the superior modern design and artistic finish is fast obtaining a foothold in foreign countries, and American woods which have very little recognition at home, are coming into prominence in Europe as very desirable, both for the manufacture of furniture as well as for interior house finishing. One of the most flourishing, profitable and important branches of American industry, is the manufacture of furniture. Not only do our factories supply the needs of 53,000,000 of people, but scarcely a ship sails from our ports without carrying among her cargo specimens of this class of manufactures. The American made furniture is preferred in several foreign countries for many reasons. The taste of the American artisan is refined and elegant, and the work he turns out is light and symmetrical as well as strong and durable. While the English, French and German manufacturers still cling to their antiquated fashions and old methods, the Americans are constantly inventing new styles or improving on the old, and are thus in this branch of industry, as well as in many others, also far ahead of their transatlantic rivals.—*Wood Worker*.

LONG runs of machinery, whether steam engines or other motors, are highly desirable when they can be accomplished with the usual appliances. The necessities of modern manufacturing are urging engine builders in the direction of machines of all kinds that can continue their work without interruption from year's end to year's end. Experience, good workmanship, careful designing and attention to the minutest details make such runs as that just mentioned possible, and that, too, in a commercially practicable way. The needs of electric lighting have been very exacting in respect to regularity of speed and long-continued runs, and these have greatly stimulated engineers in their efforts to make engines capable of producing large power in small space, and keeping up their work for long periods without interruption.—*Iron Age*.

STEEL nails seem to be working their way into popular favor. At first the extra cost of steel nails was one and a half cents per pound, or $1.50 per keg, but it has now been reduced to $1. The great advantage of the steel nails is that they can be driven into hard wood as easily as an iron nail will go into a pine board. Steel nails have been driven into a white oak knot without bending. Nothing else is now used in laying hard wood floors, as they require no boring, but are driven readily. For all kinds of finish they are especially adapted, and as so much hard finish is now employed their use must be on the increase. They are also used largely by builders, and box makers are increasing their demand for them. Box makers have been using the better grades of iron nails, as they desire those that can be drawn and redriven.

A GOOD boiler, properly proportioned, and not driven beyond its normal rating, and with good feed water, when there is no provision made for superheating, should give practically dry steam, that is, not containing above three per cent of moisture. If there is a superheating surface attached to the boiler, the steam may not only be perfectly dry, but heated to a temperature considerably above the temperature due to its pressure, while with a boiler having insufficient steam space, certain kinds of bad feed water, or which is driven too hard, the amount of water carried over with the steam may be ten or fifteen per cent.

BAND SAW FOR IRON AND STEEL.—The hand saw seems to be constantly enlarging its field of usefulness. The latest advance in this direction consisted in an interesting application of this device, as shown at the late Engineering and Metal Exhibition in England, for cutting cold iron and steel. The appliance, which was of English manufacture, is said to have met with gratifying success, and is now extensively employed in arsenals, gun factories, locomotive shops and the like, for cutting out gun carriages, tender and wagon framings, ship plates, etc.

ANCIENT CIRCULAR SAWS.—That the hard basalt and granite used in Egyptian buildings of some 4,000 years ago, were cut by circular saws of some sort, is proved by recently examined specimens with the tool marks fresh upon them. The circular marks are as distinct on these imperishable stones as on a fresh pine plank. This proof of the existence of ancient circulars is curious, for that form of saw has been believed to be of modern invention.

THE KEELEY MOTOR.—Dispatches from New York of the 29th inst., say the famous Keeley motor is at last completed; that the final inspection of the machinery has been held, and that it will soon make a trial trip to New York. Treasurer Green, of the Trustees, expresses himself as exceedingly hopeful, and declares that the day of Keeley's vindication is very close at hand.

A MACHINE for compressing sawdust and shavings into small cakes or bales to be used for fuel is attracting considerable attention. The fuel thus made has an ascertained value of $3.25 per ton, and is manufactured at a total expense of 70 cents per ton on board vessel or cars at place of manufacture.

AS THE strength of a chain is equal to that of its weakest link, and the carrying capacity of a water pipe equal to that of its smallest part, so the conductivity of an electric circuit is only equal to that of the part which offers the most resistance.

SCIENTIFIC PROGRESS.

Scientific Inquiry.

The Victoria Philosophical Institute is an association in England which now numbers 1,020 members, of whom about one-third are foreign born—mostly Colonial and American. This association was founded to investigate all questions of philosophy and science, but more especially any which may be alleged to militate against the truth of revelation.

At a recent session of this society in London, a carefully prepared report was read on the various theories of evolution, in which it was attested that, as yet, no scientific evidence had been met with giving countenance to the theory that man had been evolved from a lower order of animals; and that there was a complete absence of any fossil type of a lower stage in the development of man; and that any positive advance in the province of prehistoric anthropology has actually removed us further from proofs of such connection—namely, with the rest of the animal kingdom. In this Prof. Barrande, the great palæontologist, had concurred, declaring that in none of his investigations had he found any one fossil species develop into another. In fact, it would seem that no scientific man had yet discovered a link between man and the ape, between fish and frog, or between the vertebrate and the invertebrate animals; further, there was no evidence of any one species, fossil or other, losing its peculiar characteristics to acquire new ones belonging to other species; for instance, however similar the dog to the wolf, there was no connecting link, and among extinct species the same was the case; there was no gradual passage from one to another. Moreover, the first animals that existed on the earth were by no means to be considered as inferior or degraded. Among other investigations, one into the truth of the argument from design of nature had been carried on, and had hitherto tended to fully confirm that doctrine.

Two sessions were devoted to a consideration of the questions raised in Mr. Herbert Spencer's philosophy. It was stated that Lord O'Neill and others had shown, by a careful analysis of his arguments, that a greater attention to accuracy in statement would have kept Mr. Spencer from arriving at those hasty conclusions which had made his philosophy remarkable.

It may be questioned whether scientists who are fully committed to any particular theory are the safest men to most carefully search for facts and reasons which may militate against their favorite theories.

Autographic Reproductions of Fossils.

Mr. Fayol recently exhibited at the reunion of engineers of Saint Etienne, a number of autographic reproductions of fossils, and explained the process of obtaining them:

(1) By means of an inking roller, printing ink is spread over the object to be copied. (2) Upon the inked object there is laid a sheet of ordinary white paper slightly moistened, and this is then pressed down with the hand or with a small pad. Such is the simple and expeditious process by which were obtained the autographic reproductions of leaves, insects, medals, lace, and fossils represented in the plates shown at the reunion.

These plates were lithographs that had been made in the following way: For the ordinary white paper that is used when merely an impression is desired, there was substituted what is called autographic paper. This latter permits the impression to be transferred to stone by a process opposite that which served to take an impression of the fossil. On sending to the printer the impression on autographic paper, which any one can take, the printing costs ten francs per one hundred double plates, or five centimes per single one. As for equipment, all that is necessary is an inking roller, printing ink, and autographic paper, all of which may be procured of the printer. The total expense cannot exceed six francs. Most of the coal fossils could not be inked directly without injuring them, and to preserve them they are previously covered with a layer of silicate of potassa. The sirupy silicate of potassa (water glass) found at drug stores is diluted with water, and the fossil is then soaked in it. The imperceptible layer of silicate preserves and even brings out with greater sharpness the slightest shades and the most delicate lines. After drying, the inking may be done without trouble; and, after the impression has been taken, all traces of the ink may be removed with spirits of turpentine.

FORMATION OF COMETS' TAILS.—In a recent paper, Mr. Ranyard gives some further details with regard to his theory as to the formation of comets' tails. He points out that the experiments of Prof. Graham and the more recent investigations of Prof. Wright show that all classes of meteoric bodies hold gas as a sponge holds water. When the meteorites are heated in the laboratory the occluded gas escapes, and as a swarm of meteoric stones in space comes up to perihelion and is heated by the sun, the occluded gases must be driven off. At a distance from the heated nucleus, where radiation into space can take place freely in all directions, Mr. Ranyard conceives that a mist is formed by the condensation of the less volatile gases. The particles of mist will be bombarded on the side towards the nucleus by the swiftly moving molecules of the more volatile gases escaping from the heated meteors. Condensation on the surface of the mist particles and evaporation from their sunward sides will be set up, and repulsion of the mist from both the sun and nucleus will follow. According to Schiaparelli's theory a comets' nucleus consists of a swarm of meteoric stones; according to Mr. Ranyard's development of this theory the tail is due to a very thin mist formed from the condensation of occluded gases, the particles of which are driven backwards by the recoil due to evaporation towards the sun.

FERMENTATION OF BAKER'S DOUGH.—It has hitherto been supposed that the fermentation of bread dough set up by sour leaven, or beer yeast, was a real alcoholic fermentation. We learn from a paper in *Comptes Rendus*, that C. Chicandard has investigated the subject microscopically. He found that the *Saccharomyces cerevisiæ* put into the dough very soon disappeared and numerous microbes, which he took for bacteria, made their appearance. These bacteria multiplied with great rapidity on the yeast in dough, and they can be cultivated in water containing yeast. Hence he concludes that the beer yeast favored the growth of these microbes. An analysis of the gases evolved during fermentation proved the presence of 70 per cent of carbonic acid, while the rest consisted of hydrogen and nitrogen. The composition of these gases is similar to those formed by the putrefaction of albumen. From this it would appear that the fermentation of bread does not consist in liquefying the starch by alcoholic fermentation, but in the conversion of one portion of the insoluble albumen of the gluten first into soluble albumen and then into peptone. Starch is first decomposed by heat in the process of baking, forming soluble starch and some dextrine. The cause of the fermentation is, however, a bacterium.

PRODUCTS OF THE SLOW COMBUSTION OF ETHER.—When the vapors of ether mixed with air pass over a strip of glowing platinum, it continues to glow and the slow oxidation produces a mixture of formic and acetic acids with aldehyde, acetal, and methyl aldehyde. Legler has investigated this product (*Ann. Chem.*), and succeeded in isolating another new substance. From the slow oxidation of 150 or of 200 c. c. ether he obtained 25 or 30 c. c. (1 ounce) of a clear liquid with a sour smell resembling aldehyde. Upon cooling this in a desiccator the new substance crystallized out rhombic prisms. It contains 26.44 per cent of carbon to 6.42 of hydrogen which points to the empiral formula $C_{11}H_{33}O_{21}$. It is a peculiar fact worthy of note, that when treated with ammonia and then acidified it exhibits the same reaction exactly as peroxide of hydrogen. Legler is engaged in investigating the constitution of this new substance.

THE PLANET MARS.—Prof. Lockyer is of the opinion that human life on the Planet Mars may be very much like human life on the earth; the light cannot be so bright, but the organs of sight may be so much more susceptible as to make the vision quite as good. The heat is probably less, as the polar snows certainly extend further, but by no means less in proportion to the lessened power of the solar rays. The professor agrees with others, that several remarkable seas—including inland seas, some of them connected and some not connected by straits with still larger seas—are now definable in the southern hemisphere, in which, as is the case also with the earth, water seems to be much more widely spread than in the northern hemisphere.

THOROUGH prevention of the moldy smell of stored corn or other cereals depends almost absolutely upon thorough ventilation. And, by the way, a bad odor anywhere in homes, offices, stores, is a hint from nature that something is wrong which requires prompt and thorough attention. All this business of applying disinfectants and so-called antiseptics do more harm than good for the most part. They simply mask poisons, to put the matter strongly, leaving the prime cause as fertile of disease-producing germs as before.

AN Austrian has invented a process for placing on copper or other metal rolls designs to be printed on any kind of woven fabric, such as cotton, woolen, silk and felt goods. By this process the most delicate tracery of lace work may be produced on furniture coverings and window hangings. Photographs, engravings and other pictures may be exactly reproduced and duplicated to an unlimited extent on copper, steel and other metals rapidly and cheaply.

ANTIQUITY OF MAGNIFYING GLASSES.—In the writings of Confucius, the great Chinese philosopher, occurs the following passage: "As we use a glass to examine the forms of things, so must we study antiquity to understand the present." This sentence points most unmistakably to the use of magnifying glasses long before the time of the writer, who died 478 years B. C.

ADAMASCORITE.—Adamascobite is the local name of a mineral which is said to be found in only one place in the world, and that is the State of Missouri. The stone is very peculiar in its structure and properties. Its cutting power is diamond like, cutting away steel very rapidly, and still retaining an exceedingly fine edge.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'NT	SALE.	SECRETARY.	PLACE OF BUSINESS.
Bodie Con M Co	California	3	50	Aug 4	Sept 10	Oct 10	G W Sessons	309 Montgomery st
Challar M Co	Nevada	12	1.00	Aug 2	Sept 6	Sept 28	W E Dean	309 Montgomery st
East Mt Diablo M Co	Nevada	3	05	Aug 13	Sept 17	Oct 8	G W Fisher	306 Pine st
Eureka Con M Co	Nevada	5	1.00	July 26	Aug 27	Sept 17	P Jacobus	309 Montgomery st
Mexican M Co	Nevada	23	50	July 17	Aug 22	Sept 11	C L McCoy	309 Montgomery st
North Gould & Curry M Co	Nevada	5	25	Aug 9	Sept 11	Oct 1	C H Mason	331 Montgomery st
Ophir M Co	Nevada	45	1.00	July 28	Aug 31	Sept 20	C L McCoy	309 Montgomery st
Potosi M Co	Nevada	13	50	Aug 13	Sept 17	Oct 8	W E Dean	309 Montgomery st
Savage M Co	Nevada	56	50	July 19	Aug 21	Sept 10	R B Holmes	309 Montgomery st
Sierra Nevada M Co	Nevada	7	77	Aug 9	Sept 12	Oct 2	R L Parker	309 Montgomery st
Silver Hill M Co	Nevada	19	05	Sept 3	Oct 8	Oct 30	W E Dean	309 Montgomery st
Tip Top M Co	Arizona	7	25	Aug 16	Sept 24	Oct 22	H Deas	309 Montgomery st
Union Con M Co	Nevada	23	50	July 17	Aug 20	Sept 11	J M Buffington	309 California st
Utah S M Co	Nevada	45	1.00	July 20	Aug 27	Sept 14	G C Pratt	309 Montgomery st
Virginia Con M Co	California	10	01	July 24	Sept 3	Sept 24	A F Benard	364 Howard st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Alaska M Co	California	3	1.00	Aug 22	Sept 24	Oct 13	A Judson	320 Sansome st
Campo Seco Copper Co	California	2	10	Aug 10	Oct 1	Nov 20	D Buck	309 Montgomery st
Como Eureka G and S M Co	Nevada	1	25	July 23	Aug 29	Sept 18	A Hermann	220 Sansome st
Excelsior Water and M Co	California	5	60	July 6	Sept 15	Oct 6	W J Stewart	215 Sansome st
Equitable M Co	Utah	28	25	July 24	Aug 31	Sept 28	C J Collins	512 Montgomery st
Golden Fleece Gravel M Co	California	3	50	Aug 1	Sept 5	Sept 22	F Schirmeier	785 Folsom st
Gorilla M & M Co	California	2	21	Aug 23	Oct 3	Oct 31	A A Emmist	456 Montgomery st
Homeward-bound M Co	California	2	25	July 23	Aug 27	Sept 10	A S Bowie	314 Montgomery st
Homer M & M Co	California	3	10	Aug 2	Sept 8	Oct 2	F E Luty	330 Pine st
Lima Con M Co	Arizona	7	05	Aug 6	Sept 10	Oct 6	R D Hopkins	436 Montgomery st
McClellan M Co	California	1	05	Aug 30	Oct 4	Oct 24	G W Sessions	309 Montgomery st
Pittsburg M Co	California	16	10	July 24	Aug 28	Sept 18	R Wegener	414 California st
Swansea M Co	California	3	25	July 21	Sept 1	Sept 24	M A Wheeler	119 Market st
Seaton G M Co	California	3	8	July 31	Sept 5	Sept 27	A Martin	525 California st
West Branch Feather River M Co	Cal	1	01	July 16	Aug 20	Sept 10	A B Paul	328 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Day S M Co	Nevada	E M Hall	327 Pine st	Annual	Sept 18
Grand Prize M Co	Nevada	E M Hall	327 Pine st	Annual	Sept 18
Hogdon M Co	California	J M Moore	Montgomery Block	Annual	Sept 18
Mono M Co	California	W Sessions	309 Montgomery st	Annual	Sept 20
Northern Belle M Co	Nevada	W Willis	309 Montgomery st	Annual	Sept 10
Pioneer M Co		A Judson	320 Sansome st	Annual	Sept 18
Pittsburg M Co	California	R Wegener	414 California st	Annual	Sept 15

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Bulwer Con M Co	California	W Willis	309 Montgomery st	15	July 2
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	July 19
Mt Diablo M Co	Nevada	R W Heath	318 Pine st	25	Aug 23
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	Sept 12
Silver King M Co	Arizona	J Nash	315 California st	25	July 12

Table of Highest and Lowest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Aug. 15.		WEEK ENDING Aug. 22.		WEEK ENDING Aug. 29.		WEEK ENDING Sept. 5.	
Alpha	2.00	2.50	2.00	2.40	2.10	2.00	2.15	
Alta	1.00	1.15	.60	1.05	.80	1.10	.85	1.50
Andes		.75		.85	.70	.75	.70	.75
Albion		.05		.50				.40
Argenta		.25		.55	.20	.30		.15
Atlas								
Belcher	1.05	1.20	1.00	1.05	1.00	1.05	1.00	1.10
Belding								
Best & Belcher	4.10	4.65	4.10	4.50	4.20	4.50	3.75	3.20
Bullion	1.10	1.25	1.10	1.20	1.00	1.10	.90	1.00
Bechtel								
Belle Isle		.40	.35	.40		.25		.35
Bodie Con	.35	.40		.25	.15	.25	.15	.55
Benton	.20	.25	.15	.20	.20	.25	.20	.30
Belle Tunnel								
Caledonia	.20	.25	.20	.25				
California	.40	.45	.30	.40	.30	.40	.20	.30
Challenge								.35
Chollar	3.20	3.60	3.10	3.30	2.70	3.30	2.90	3.10
Confidence		2.20	2.05	2.25		.35	1.90	2.00
Con Imperial								.10
Con. Virginia	.40	.70	.55	.65	.65	.75	.55	.60
Crown Point	1.20	1.25	1.00	1.20		1.15	1.10	1.20
Day								.50
Elko Con								
Eureka Con	5.50	6.25	6.00	6.25	6.75	7.25	6	7
Eureka Tunnel								
Exchequer	.60	.75	.55	.75	.60	.65	.55	.65
Grand Prize				.30		.25		.20
Gould & Curry	3.15	3.65	2.85	3.35	3.10	3.25	2.40	3.05
Hale & Norcross	6	6	6.30	6.25	5	6	4.70	4.95
Holmes								
Independence			.50	.55				
Julia		.15		.15	.05	.10		.10
Justice	.30	.35	.30	.35	.30	.40	.35	.65
Jackson						.50		
Kentuck								
Martin White		.25						
Mono								
Mexican	3.20	3.75	3.35	3.80	3.65	3.85	3.45	3.80
Mt. Diablo			6.25	6.50	4.15	4.25	3.25	4.50
Mt. Potosi								
Noonday								
Northern Belle		6.50	6	6		6	5.00	6.75
North Noonday								
Navajo		3.15	2.60	3.20	2.95	3.00	2.80	2.90
North Belle Isle		.40		.40			.55	.60
Occidental		1.70						1.50
Ophir	3.50	4.15	3.05	3.95	3.05	4.00	3.45	3.70
Overman		.40	.40	.45				.35
Oro								
Potosi	1.20	1.40	1.15	1.30	1.05	1.20	.75	.90
Final Con								
Savage	2.05	2.40	1.85	2.55	2.40	2.60	1.85	2.20
Seg. Belcher								
Sierra Nevada	4.35	4.70	4.2	4.70	3.75	4.30	3.10	3.95
Silver Hill		.10		.10		.10		
Silver King	3.90	6.50	6.50	7.00	7.00	8.00		8.00
Scorpion	.60	.70	.55	.65	.60	.65	.55	.60
Tuscarora								
Union Con	5.00	5.75	5	6.25	5	5	4.85	5
Utah	2.50	2.95	2.00	3.20	2.90	3.20	2.60	3.00
Ward								
Wales								
Yellow Jacket	3.30	3.55	3.05	3.55	3.05	3.25	3.15	3.35

Sales at San Francisco Stock Exchange

THURSDAY A. M., Sept. 6.

2890	Alta	1.10@1.15	
50	Alpha	2.05	
100	B. & Belcher	.4	
400	Benton Con	.30c	
200	Bodie Con	.60c	
180	Chollar	3.20	
400	Con. Virginia	.60c	
300	California	.25c	
50	Confidence	.2	
160	Eureka Con	.7	
310	Gould & Curry	.22@2.80	
550	Hale & Nor	4.40@4.60	
100	Julia	.10c	
30	Justice	.65c	
200	Indy Wash	.10c	
330	Mexican	3.60@3.65	
100	Navajo	.2	
20	Northern Belle	.6	
325	Ophir	3.60@3.65	
150	Potosi	.90c	
650	Savage	2.10@2.15	
125	Sierra Nevada	3.25@3.30	
40	Silver King	.8	
300	Solid Silver	.15c	
50	Utah	2.80	
150	Union	.5	

AFTERNOON SESSION.

10	Yellow Jacket	3.20	
2050	Alta	1.45@1.50	
50	Andes	.70c	
300	Argenta	.15c	
100	Benton	.25c	
50	B. & Belcher	.4	
150	Chollar	2.95	
800	Con. Virginia	.55c	
100	California	.20c	
60	Eureka Con	.7	
250	Exchequer	.65c	
300	Gould & Curry	3.65@3.70	
200	Grand Prize	.15c	
470	Hale & Nor	.40@.42	
600	Justice	.60@.65c	
260	Mexican	3.55	
100	Northern Belle	.6	
600	N. Belle Is	.55c @.6	
90	Ophir	3.50	
200	Potosi	.85	
70	Scorpion	.55c	
300	Savage	1.95	
420	Sierra Nevada	3.20@3.30	
240	Union Con	.5@.5	
30	Utah	2.70@2.80	

AN English newspaper reminds us that United States treasury bonds to the amount o £24,000,000 are held by three persons—the Duke of Southerland, Sir Thomas Brassey, and the Baroness Burdett-Coutts.

Mining Share Market.

The market this week has been comparatively strong, as our stock tables show. Yet there have been no special developments to record. On the Comstock everything is moving on about as usual. At Gold Hill the work at the several leading mines is now principally introductory to active operations when the mills on the Carson river can again run to their full capacity.

The bailing tanks are running at the Alta and are lowering the water at the rate of 25 ft. per day. When the tanks were put on the water was up to the 1100 station, but it has been lowered to within a few feet of the 1200 level. The pumps above the Sutro tunnel level have been removed.

The following mines report cash on hand on September 1st: Alta, $32,785; Argenta, $866: Andes, $9,507; Albion, $364; Benton Con., $8,476; Best & Belcher, [$362; Bulwer, $914; Bodie Con., $13,287; Belcher, $24,786; Crown Point, $23,591; Con. Virginia, $87,161; California, $1,803; Con. Imperial, $4,478; Chollar, $8,756; Challenge Con., $5,365; Gould & Curry, $30,841; Hale & Norcross, $4,986; Jackson, $3,850; Mexican, $5,003; Northern Belle, $13,290; Ophir, $76,073; Occidental, $5,860; Potosi, $8,158; Scorpion, $160; Standard, $132,707; Sierra Nevada, $15,608, Savage, $22,510; Utah, $9,456.

Bullion Shipments.

Contention Con., Sept. 1st, $12,730; Hanauer, 1st, $5,100; Ontario, 2nd, $17,425; Horn Silver, 2d, $42,000; Alice, 2d, $11,375; for August, $119,109. Silver Reef mines, for August, $42,077. There were shipped from Salt Lake during the week ending Saturday, September 1, 47 cars of bullion, 1,171,024 pounds, sent East; 40 cars ore, 780,000 pounds, sent to Colorado, and 97,130 pounds sent West; one car white lead, 22,500 pounds, sent West, and 3,000 pounds granulated lead sent to Denver, making a grand total of 88 cars, aggregating 2,073,654 pounds.

LOW GRADE GOLD ORE.—In the Mint Director's report of this year is the following suggestive paragraph referring to the Zeile mine: The rock is low grade and assorted in the mine; the best is sent to the mill, the balance thrown aside in the drifts. It is by a careful system of working that the mine is made to pay. The rock only pays $2 per ton in free gold and from $5 to $6 per ton in sulphurets, which brings the yield up to a fair average. This proves that with good management and strict economy, together with good facilities for mining and working the ore, it can be made to pay when of very low grade. There are thousands of quartz ledges in this State that could be worked and made to pay handsomely if the same system was adopted as by the Zeile mine. Quartz mining would receive a wonderful impetus in California if a proper system of mining and milling and the saving of sulphurets were adopted. A good deal of prospecting has recently been done in the Zeile mine. In running north a new ore body was reached and a large amount of work done to ascertain its value. It has been found to increase in size and richness, and the present outlook is that the ore in sight will last for many years. Attached to the mine are chlorination works, which are kept running day and night working from 4 to 5 tons of sulphurets every twenty-four hours, yielding large returns.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned

CALIFORNIA.

Amador.

VOLCANO.—Amador *Sentinel*, Aug. 29: The hot weather has almost exhausted the water in the streams. The Grass Valley claim has hardly enough water to clean the bedrock which will be completed this week. The Downs mine is working half force, taking out splendid rock, and will have a large amount ready for crushing when water can be had. Terrry Gillick has a crushing ready at the mill. He will crush at the old Stewart mill next week. The tunnel company is fitting up its claim and will be ready for early rains. R. Stewart has found a fine ledge of $25 rock at his mine on the river and is taking out ore and will crush when he can obtain water. The mining outlook was never better than at present.

Calaveras.

MURPHY'S CAMP.—Cor. *Citizen*, Sept. 1: Our mining interests never looked more promising. The Oro Plata mill and chlorine works are running up to their full capacity. Heavy bullion shipments are regularly made. The shaft on the old Blue Wing lode is being sunk as fast as three shifts of men can do it, and is now down near 120 ft. Some excellent ore has been struck at a depth of 110 ft. Supt. Parhani, of the Roble mine, a recent purchase by San Francisco parties, a mile west of town, near the Rocky Bar, and other well-known mines, is in the right locality for a desirable property. This mine has been worked in former years with good results. The company is fitting up a 5-stamp mill. They have 14 men employed in the mine and mill. Sublett & Dodge are running their mill on ore from the O. K. and other mines in the vicinity. The return of prospectors from the new district in Alpine county, called "Green Rock district," from the copper stain in the rock, will doubtless add to the boom, for that part of Alpine will be added to this when Alpine is disorganized. Virgin gold has been found there in paying quantities in the gulches, and Bullion hill seems to be one mass of mineral. The formation is similar to that in Bodie, Lundy and Tioga districts.

El Dorado.

ROSECRANS.—Georgetown *Gazette*, Aug. 31: The Rosecrans mine and mill are running steadily, and the report of the steam whistle falls cheerfully upon our ears. It is reported that the old Taylor mine, near by, is about to be opened up and new works put upon it.

EUREKA.—Last Saturday the steam whistle of the Eureka sounded the welcome news that the pump had been put to work. The mine is now pumped out, and work on the lower or 240 level will begin. The new mill (40 tons capacity) will be ready for trial in another week. In cutting a ditch for sinking the iron pipe to convey water from the main ditch to the Leffel turbine wheel, a three-foot ledge of fine looking quartz was found which proves to be of high grade.

WHIMTOWN.—El Dorado Cor. Placerville *Republican*, Aug. 30: Whimtown is on the famous Greenstone belt, between this place and Shingle springs. The first mine on the Greenstone was discovered by Henry Barnes three years ago. Mr. Barnes has worked his mine ever since with good results. Graham brothers have done equally as well. Fred Tuck has been getting from $5 to $10 to the pan, and only down 20 ft. Briggs & Crane are getting good pay. Hayes, Casey & Co. are sinking a shaft; they are down 25 ft., and have a flattering prospect.

Fresno.

MT. RAYMOND.—Fresno *Republican*, Aug. 25: The principal mines are five miles above Big Tree station on the Yosemite route. The mineral formation extends along the range from five to eight miles and seems to be practically inexhaustible. Some of the ore assays sixty per cent of lead besides paying quantities of silver, while the ore from other mines assays from $75 to $125 to the ton in silver and contains but little lead. Don Pedro, agent for capitalists of San Francisco, is now at the mines, and has bonded several mines at from $5,000 to $20,000.

Inyo.

KEYNOT. *Independent*, Sept. 1: Of late the Lasky mill at Beveridge has not been running very steadily, and has been crushing only 15 hours out of the 24. Since the 22d of July it has reduced 80 tons of Keynot ore, which resulted in 340 ozs. of gold at $14, amounting to $4,760. Twenty-one tons of ore from the True Business mine were also crushed, which yielded 75 ozs. of gold, worth $15 per ounce, amounting to $1,125. The works are now in steady operation, and there is plenty of ore on hand.

Mono.

NOTES.—Homer *Index*, Aug. 25: The May Lundy mine is still running with a light force. The mill is being run up to its full capacity, and the bullion shipments are regular. The Detroit Copper Co.'s furnace, which was shut down for repairs, and to await the arrival of coke, has resumed operations. The Virginia Creek hydraulic mine continues to yield largely, though the supply of water is limited. All the arastras in Lake canyon are running up to their full capacity. The Gorilla M. & M. Co. made its third shipment of bullion for the season during the week.

NOTES.—Homer *Index*, Sept. 1: Very rich ore is being encountered in the Josie Green and Collamer mines, and steps are to be taken at once to open both claims on a more comprehensive scale. The Homer M. & M. Co. has recently purchased several adjoining claims.

STANDARD CON.—Bodie *Free Press*, Aug. 28: During the past week there was shipped to the mills 1,407½ tons of ore. The bullion shipment was valued at $13,663.46. The east crosscut, 1200 level, is in 497 ft. North drift No. 1, 1000 level, was driven 13 ft; total length, 304 ft, showing 2 ft of vein.

BULWER CON.—The west crosscut from the north drift, 700 level, was advanced during the week 12 ft, and it is now in 421 ft.

SYNDICATE.—The mill is running steadily.

BODIE CON.—During the past week there were 136.67 tons of ore hauled to the mill, and 155.925 were crushed. The average assay value of the pulp was $38.27, and that of the tailings was $6.48 per ton. The bullion shipment was valued at $7,072.76.

BODIE TUNNEL.—The west crosscut on the 250 level was advanced 13 ft during the week. The south drift on the 200 level was extended 10 ft. The ledge looks well, and good assays are being obtained,

Nevada.

IMPERIAL.—Grass Valley *Tidings*, Aug. 27: We learn that the Imperial Co. started their pumps this morning, and that in a few days the mine will be free from water. Sinking will be commenced this week.

The Magenta M. Co. have commenced grading for their machinery. To-morrow the steam hoisting and pumping works will be removed from the old Republic mine, and set up on the Magenta, and the work commenced with a single force of men.

PROVIDENCE.—Grass Valley *Tidings*, Sept. 1: If the Providence mine, Nevada City, has been sold, the men who have owned it all along do not know the fact. The newspapers know all about it.

There will be some fine specimens of quartz and gravel gold on exhibition at the pavilion from North Bloomfield.

DERBEC.—*Transcript*, Aug. 29: The new tunnel at the Derbec mine has about 400 ft further to go before it will connect with the most southern drift of the old workings. Some of the richest gravel ever found in that part of the county has been taken out in running this tunnel.

THE PROSPECT.—The mining outlook in the Nevada City quartz district never looked so promising as now. During the past few weeks we have heard of at least a dozen new enterprises. From present appearances this district in another year will need at least a thousand more quartz miners than are at work here to-day.

Placer.

IOWA HILL.—*Argus*, Aug. 30: The Homeward Bound mine is fitting up for next season's work. Dr. Allan Brown, of San Francisco, who is interested, is up watching progress. It is rumored that the proprietors of the Orion will move their pipe across the canyon and commence this winter's operations on the North Fork side of town.

FOREST HILL.—Mr. S. S. Willard, of Forest Hill, is about to open his quartz mine in good shape. A shaft is being sunk, and a new hoisting works and boarding house will be erected forthwith. The mine, which is called the San Francisco, is near the May Flower.

Plumas.

SOUTHERN PLUMAS.—Quincy *National*, Sept. 1: Every old miner in northern Sierra and southern Plumas knows that miles and miles of the old Blue lead lie buried under the lofty ridge, but the buried treasures have waited for the necessary capital. This is now at hand, and some very extensive developing operations will soon be commenced in the Gibsonville and La Porte ridge, and in the Onion valley and Washington hill ridge. The Chicago Co. have drilled many miles of these ridges, and have satisfied themselves in regard to depth and extent. They are now running three tunnels, and more will soon be started.

THE MOUNTAINEER.—A rumor comes that the ground belonging to the Mountaineer Co., at Onion valley, has been sold Eastern capitalists. We hope this is true, for the ground is one of the many claims in southern Plumas which only needs capital to make it produce richly. The old company worked for many years to get in their tunnel, but their purses were not long enough, and they had to stop just when they were nearing the pay gravel.

CROMBERG NOTES.—This section must be on the road to prosperity. Many of our old settlers and old timers are coming back, after an absence of months. Aleck Irwin, Bissell and Bell have arrived lately, and they are all old miners in this section. Charley Hanson is running a tunnel for the Consignee Gravel M. Co. This company have spent several thousand dollars in the search for the rich channel running through this section. Hanson says the rock in the tunnel is very hard.

RICH GULCH.—Cor. Quincy *National*, Aug. 25: The first location we come to is the Hyde quartz lode, commencing at Twelve-Mile bar. Here a little work was done a few years ago, with good results, but as the owner was without capital, no mill was put up. The next is the Hallsted mine, and here a good deal of prospecting has been done. The ledge has been opened in several places, and shows splendidly. I am satisfied that the rock will yield an average of from $8 to $10 per ton. It is from 8 to 25 ft. in width, and can be tapped with a tunnel from 1,000 to 1,500 ft. deep. While I was there, in one of the upper tunnels, Mr. Hallsted found rock that would yield from 25 to 75 cents to the pan, in free gold, without crushing the rock. It was as fine a prospect as I ever saw in any mine. Still further up the gulch we came to Frank Hill's. He has a tunnel in 100 ft, which taps the ledge at 100 ft. in depth. The tunnel was in quartz about 6 ft. The rock prospects uniformly and well. Henry Patten has the next location, and gets splendid prospects from the croppings. His tunnel is not yet in. Fred Lewis has the next location, and gets splendid prospects. Further up the gulch we come to Mr. Cameron's ground, and he has a tunnel in 60 ft., with a ledge 14 ft. in width, and the rock first-rate. The next location is known as the William Penn. Here the ledge shows 20 ft. in width, and with good prospects in croppings, some of the specimens showing free gold.

Sierra.

NOTES.—*Tribune*, Aug. 30: Capt. Mead will begin work on his recently purchased quartz ledge in Pig canyon, soon. The machinery to be used in the Rainbow mine was unloaded there Sunday. One hundred and sixty-eight ounces of gold was cleaned up by the Bald mountain extension last Sunday from gravel out of the South Fork ground. A quartz ledge at Scott's Flat, owned by Casper Bobb, has been bonded to parties from below. A company from below has purchased a quartz ledge east of Cold Spring and commenced developing. Attachments were levied on the Morristown hydraulic claim last week to the amount of $6,000. The suit was brought by employes, to whom the above sum was due in wages. About $20,000 was cleaned up from this mine a few weeks ago as a result of the season's work, and the gold was shipped below.

NEVADA.

Washoe District.

SIERRA NEVADA.—*Enterprise*, Sept. 1: On the 2900 level timbering up the main north drift. Good

pregres is making in sinking the joint Union Con. winze below the 3000 level.

UNION CON.—The joint Sierra Nevada winze below the 3000 level is now nearing the point where should be found the body of quartz and low grade ore passed through by the main west crosscut.

YELLOW JACKET.—Are repairing the main shaft. Are not doing any work underground for the extraction of ore, but some ore is being obtained from the Sagebrush level.

UTAH.—A fan station has been cut out in west drift No. 1 on the 150 level and a fan put in to draw out the foul air that comes in from the old workings below. The ore-house is completed and the ore from the croppings is being dumped into it.

MEXICAN.—The upraise from the 2900 level is nearing the bottom of the winze down from the 2700 level, from which it is draining the water. The rock is still very hard, but contains seams through which the water finds its way. The main north drift on the 3100 level is being advanced 30 ft per week.

HALE AND NORCROSS.—The overhauling of the pumping apparatus at the Combination shaft has been completed and active operations have been resumed in the winze below the 2600 level. The ore still holds in the bottom.

ANDES.—A great deal of solid metal-bearing quartz is being encountered. The quartz is so hard that it must all be blasted.

CROWN POINT.—A tramway has been constructed on the surface conjointly with the Yellow Jacket Co.

GOULD AND CURRY.—On the 1,500 level the east drift is being advanced at the rapid rate of 80 ft per week. It has been cutting streaks of fine looking quartz. The ground now being explored eastward is very promising.

BULWER.—The dumps are full of ore, and work will not be resumed until there is sufficient water to run the mills to their full capacity.

IMPERIAL.—The work of overhauling the gallows frame at the Imperial hoisting works is about completed.

ALTA. Bailing tanks have reduced the water nearly to the 1200 level. The pumps will soon be started up.

UTAH.—The north lateral drift on the 1350 level is being advanced at the rate of 30 ft per week.

SAVAGE. Nothing is being done on the 2600 level, but a start will be made at that point soon.

CALIFORNIA. The joint Con. Virginia drift is completed and is taking up the water to the 2800 tank.

CON. VIRGINIA.—The joint California drift is completed and is conveying the water to the 2800 tank.

CHOLLAR.—Crosscutting will not be resumed until the new hydraulic pump has gone into operation.

BEST AND BELCHER. The water is being allowed to drain out of the west drift on the 2500 level.

SCORPION. The west drift on the 500 level is cutting occassional streaks of clay and quartz.

UNION SHAFT. Are still repairing the 2300 station

Belmont District.

ARLINGTON. *Courier*, Aug. 25: The Leaching works in Nye county are producing fine bullion. The owners, Geo. Nicholl & Co., shipped yesterday one bar of bullion weighing 1,345 ounces, 963 fine, and valued at $1,674.66.

NOTES.—The mines in Northumberland district are yielding good ore. The company shipped three more bars of bullion on Tuesday last weighing 271 pounds and valued at $4,309.66. George Nicholl informs us that the outlook in Western Nye is good. The Ellsworth mill is being repaired, and will be started up on ores from that district, of which there are large quantities on the dumps. Everything is moving along finely at Ophir canyon. The Twin River M. Co. shipped another bar of bullion on Tuesday last weighing 94 pounds, valued at $1,389.77. The Jefferson mill is running, and the company shipped several bars of bullion during the week. George Nicholl & Co. have 2,000 tons of pay rock on the dumps in San Antonio district. In the Belmont mine, good ore is encountered daily. Some of the mine owners in Ione district will have their ores leached at Ellsworth.

Bernice District.

NOTES.—*Silver State*, Aug. 28: From Bernice district, the *Reveille* learns the following: The Wild Goose mine, owned by Charles Jourdan & Co., has a tunnel in 200 ft, and is opening up a splendid ledge. The ore runs from $100 to $200 per ton. They have 100 tons on the dump ready to be milled at the Bothwell mill. Gilbert & Hoyt have a tunnel which taps excellent sulphuret ore. They have three men stoping and are getting out fine rock. They sent 30 tons to Salt Lake for reduction, and realized satisfactory returns. They have just started a tunnel 100 ft lower which will tap the ledge at 300 ft. About 10 tons of ore is on their dumps. Wallace Goodell, the owner of the Golden Crown mine, has the best property in the district. The ledge is three ft thick, and is very rich. He keeps four or five men at work taking out ore, and has 200 tons now on the dump. His rock is free milling, while that of the other mines needs roasting.

Esmeralda District.

SILVER STAR.—Hawthorne *Herald*, Sept 1: About 15 miles south of Luning, is one of the largest bodies of copper ore in the world. Parties who have visited the ledge say that it is indescribable. There are two parallel veins running easterly and westerly that crop out in places over 100 ft deep. Furrows have been cut down through the exposed ledge by the action of the elements and all through as far as exposed it is one mass of copper ore. Several hundred tons have been taken out of various parts of the lode that runs from 10 per cent to 60 per cent per ton. Dunlap, Menzie & Abrahams the owners, have bonded the proprrties to Giles & Garvin for $40,000.

COPPER.—The Mount Vernon Copper Works at the mouth of Mill creek, Mono county, are shipping from 15 to 20 tons of crude copper bullion weekly to Oakland for refining.

WABASH.—*Ledger*, Sept. 1: This mine is south of the Talisman, between Sutter creek and Amador City. It is owned by Cal. Hammack and others. Some four or five years ago it was worked on a small scale by an arastra, and the rock paid well. Recently work was resumed on a different part of the mine. A tunnel has been run into the hill. One day last week a crosseut encountered a ledge 20 inches wide with a regular gouge. This vein is exceedingly rich, showing free gold in abundance. Parties who have examined specimens estimate that it will go $1,000 to the ton. This strike is considered of much importance.

MIDDLE BAR TUNNEL.—The contract for the first 1,000 ft was signed last Tuesday. Fox & Claich are the contractors. It is found that the muddy water as it comes from the ditch will not answer for the air compressors. A large tank is, therefore, being constructed in which to settle the water.

NOTES. The first clean-up of the 5-stamp mill on the Hageman, Malsom & Fleming claim, near Butte City, was made on Tuesday, and turned out exceedingly well. The Stewart boys are getting out some fine looking rock from their claim close to the Hageman. The Jackson mine is employing 15 men. Mr. Hayward inspected the mine this week, and it is understood that he contemplates buying an interest. The crushing of the rock at the Oneida is still in progress. On the Mahoney the judgment creditors have advertised the mine to be sold by the sheriff on the 17th of September. This time they are determined to get their money. There is a movement on foot looking to another compromise. The Benjamin party are willing to put up $10,000 to work the mine, if the creditors will release the property and consent to wait for their money. The creditors, outside of the lien-holders, are willing to fall in with the arrangement, but it is doubtful if the others will consent. The Sutter creek sulphurets works, now owned by C. J. Nickerson, started up a week ago on sulphurets from the Bunker Hill mine. The quantity to be treated will take 10 weeks to dispose of.

VOLCANO. *Dispatch*, Sept. 1: I. Gillick is now ready for crushing. He has a good deal of rich rock out, and has four men employed. The Stewart mine, on the Mokelumne river, is looking well. Jake Griesback is running his arastra on Pioneer creek.

Eureka District.

EUREKA CON.—*Sentinel*, Aug. 29: The principal interest in this mine just now is with regard to the fight against the water in the new shaft. Mr. Read, the superintendent, tells us that it is only a question of time when the mine will be drained. The machinery is working well and the water is being lowered all the time. He is satisfied that the flood is confined mainly to the ledge. As an indication of this the water in the old workings has gone down from above the 1,200 level to about the 1,300, and the shaft in the Phœnix has already been pumped dry.

Paradise District.

BULLION. *Silver State*, Aug. 27: Yesterday J. V. McCurdy shipped one bar of bullion, valued at $2,111.27, to San Francisco. This was the second shipment from the Paradise Valley mill since Mr. McCurdy assumed the management.

Ploche District.

DAY.—*Record*, Aug. 25: They have encountered copper ore on the sixth level of the Day mine, in working around the ore chamber lately struck. It is on the east side of the chamber. The foot of this copper ledge is three ft in width. From selected ore, a test made by Supt. Grim, showed 70 per cent copper. A person, on looking at the sample, would take it to be mostly lime. The whole ledge will go from 35 to 45 per cent copper, and about $40 in silver.

Tuscarora District.

BASIN MINE.—*Times-Review*, Aug. 28: Although the mill is idle on account of scarcity of water, a shaft which is being sunk a hundred feet above will in a few days furnish the necessary supply, and the stamps will be set in motion about the first of the month.

SHIRT ANCHOR.—The owners of this mine are having the shaft cleared of water. The ledge at the depth of one hundred ft is four ft in width and well defined. The rock carries gold and improves as depth is attained.

White Pine District.

TAYLOR.—*News*, Aug. 25: The Monitor Co. knocked off 12 men on the first of August. They have lots of ore at the mill and mine. The Argus mill is going up slowly. It will not be completed for three months at least. All the mines here are looking well, and our prospects for the future are good, and the croakers, who always predict disaster to any enterprise, are not likely to have prophesies of ill-omen vertified in Taylor for several years to come.

ARIZONA.

UNITED VERDE.—Prescott *Courier*, Aug. 20: The United Verde Co.'s smelter is running out 16 tons of copper daily. It is in the Black Hills 17 mills north east of Prescott.

DOSORIS.—The Dosoris mine, south of Prescott, is now at a depth of 400 ft, glittering with brittle silver. Never before has it looked so well.

TIPTOP.—We heard, Saturday, that sinking in the Tiptop mine, is now pleasant and profitable. The men have very rich quartz at a depth of 700 ft.

RICH ROCK.—E. Stahl, of the Prescott Assay Office, has just tested quartz brought from a distance of 40 miles from Prescott. A careful assay showed it to carry $4,735.08 per ton in gold, while there are in this amazingly rich rock streaks of telluride, worth $100,000 per ton in gold. The finder of this rock may have told Mr. Stahl all about its location, but if he has Mr. S. would not tell our reporter. Gentlemen who recently examined Philip Richardson's Gray Eagle mine, Bradshaw district, wonder why it is that a mine of its great size and richness is allowed to lie idle.

TINTO BASIN.—C. C. Hyile, who has charge of the Excursion mill, says the gold mines of the Mazatzal mountains are good. A New York Co. owns the mill and a group of mines, the best of which are the Excursion, opened to a depth of 150 ft; the Summit, the American, the Dollar and a mine which formerly belonged to Brown Bros. Dr. W. W. Jones is superintendent of mill and mines.

BLACK HILLS.—Gentlemen who reached Prescott yesterday from Black Hill's district tell us that the smelter ran out 10 tons of copper in 24 hours. Coke is scarce.

NOTES.—Final *Drill*, Aug 25: The Frankfort is cleaning out the shaft and tunnel. On the Australia work continues; good ore found all the way. The Bilk and Mowry are repairing damages from the storm. The Silver King is also repairing the mischief of the storm. Mill runs as usual. The storm has not interfered with the hauling of the ore to the mill. In the Monarch of the Sea they are cleaning out the shaft after the storm and clearing out the fine new road now almost obliterated by brush, bowlders, wash outs, etc. They will soon have steam hoisting machinery. On the Nacoochia work has been discontinued, to be resumed soon, but on contract. The shaft is now 67 ft deep. Fine smelting ore was obtained. They have found the foot and hanging wall. On the Specie Paying, the work has been discontinued, all the attention being given to the boring of the well, which began on Friday of last week; it is situated at Cottonwoods, half a mile from the mine.

BELLE.—The Belle mine has bulged so that a small force of miners take out more ore than the smelter can get away with. Sixteen mules, drawing 16,600 pounds of bullion, started from the smelter, yesterday.

COLORADO.

ISMAN. Georgetown *Courier*, Aug. 23: The Inman lode, a recent discovery on Chicago creek, assays 405 ounces silver and four per cent copper at grass roots. The vein has been opened up at intervals for 300 ft, and is not less than 6 ft between walls in any place, and carries from 4 to 9 inches of mineralized quartz. It is owned by R. B. Griswold and son.

EXCELSIOR MINE. *Gazette*, Aug. 25: The vein is from 6 to 8 ft in width, having porphyry for hanging wall and micaceous rock for foot wall. Mr. Collom now has a shaft 80 ft in depth. A recent mill-run gave a return of $118 per ton and another shipment will be made in a few days.

QUEEN.—The Queen mine on Seaton mountain is constantly improving. The ore averages $150 to the ton and is increasing in quantity.

NOTES.—An assay from the South American lode on Ute creek gave 230 ounces silver. This property is owned by Sporborg & Fallon. The Meade boys have three inches of gray copper and sulphurets in the Rochester lode, which give an average of $250 per ton. The last shipment from the Tropic was five tons, which made a return to the lessees of about $700. The Little Mattie made a shipment of three carloads of high grade ore this week. This month there will be 100 tons shipped. An assay made on ore from the Sheldon lode ran 258½ ounces silver, 2 2-10 ounces gold.

SUMMIT CON.—Georgetown *Miner*, Aug. 25: General Lord struck it rich again on Tuesday. Sulphurets, crushed with the gangue, ran 896 ounces in silver. Of course the sulphurets by themselves would run high in the thousands. Even the latest mill runs from the summit proper, 11 ft distant, were: first-class, 2,155; second class, 449 ounces. Our reporter was shown specimens which assayed: One 6,574 ounces; another, on a different vein, 90 ft up the shaft, 4,440 ounces; a third, from a one-hal finch ore streak, 3,700 ounces. From the Precinct, 90 ft northeast, were seen specimens equally good. From the upper level of the 171 ft shaft, at a depth of 110 ft, came specimens which had been exposed to a forge fire. Beads of silver had bubbled out as big as shirt studs, and one bead left a mark on the stone on which it fell as large as a three cent piece. General Lord is astonished himself at the quantity and richness of the mineral.

IDAHO.

SMOKY BULLION.—Wood River *Times*, Aug. 22: If snow does not fly too soon, Mr. Martin says the concentrating works will be ready this fall. The wagon-road is completed to within three-quarters of a mile of the mines and within 10 days a buggy can be driven clear up to the mine dumps.

PRIDE OF IDAHO.—A rich strike is reported in the Pride of Idaho mine. The average assays give 240 ounces in silver and 68 in lead to the ton, with a strong body of ore in sight. Ore is being sacked for shipment to the sampling works.

BIG CAMAS.—Matthew Williams arrived in town to-day from the Big Camas mine. The shaft is 20 ft down on solid quartz. This mine has a wonderful outcrop. The quartz stands up above the country rock, from 2 to 6 ft high, and 20 to 60 ft wide, a distance along the vein for 600 ft, and the 20-ft shaft is in the same quartz. All the quartz assayed returns $75 in gold and 13 ounces in silver per ton, and 300 tons of such quartz could be delivered immediately to a mill. The outcrop, for 600 ft in length, has not a break. The walls are 40 ft apart, the vein solid pay quartz, and a 20-stamp mill can be kept at work the year through. The mines are not over 12 miles west from Hailey.

SAWTOOTH.—The Eureka mine, under lease to Colonel Broadhead carries a rich streak of silver ore, samples of which assay $2,000 and even $4,000 per ton. The Sawtooth mill started running on Tuesday. At Vienna the company's mill has been running steadily for six weeks. The first week it ran on low-gade stuff. Since it has been running on good ore, the mill has yielded 16 bars of bullion worth an average of about $1,500. This is at the rate of about $750 per day. The mill having a capacity of 20 tons, this indicates an average yield of $37.50 per ton. Of the 20 tons worked daily, 12 are from the Mountain King and 8 from the Vienna—both of which are the property of the Vienna Mill Co. The King ore is of low grade, while the Vienna is rich, and by mixing the two a good result is obtained. The cost of mining and milling should not exceed $20, and thus leave a profit of $17.50 per ton.

SMELTER ITEMS.—Ketchum *Keystone*, Aug. 18: The bullion output from the new furnaces ranges from 350 to 450 bars daily, with an average weight of 100 pounds, making about 20 tons the total yield. The 40-ton furnaces have been idle a day or two to admit of repairing broken machinery and connecting the east furnace with the main dust flue. They will be put in operation soon.

ELKHORN.—Ketchum *Keystone*, Aug. 22: Judge Lewis has several pieces of native silver from the Elkhorn vein on the slope between tunnels No. 1 and 2. He has one piece that will weigh nearly an ounce and is pure, white silver; a beauty. Flake silver is quite common on specimens of the galena taken out.

BANNER.—*Tri-Weekly Statesman*, Aug. 25: This mine is developed by a tunnel 900 ft long, is all opened out, and is one of the best worked mines within the Territory. They are working 38 men, which keeps the 20-stamp mill running day and night. The average battery assays yesterday ran a little over 500 ounces silver per ton. The company owning this property are from Elmira, N. Y. They purchased it for $40,000, and in less than a year paid for it from the mine, and declared a dividend of $90,000. The output this year will reach $250,000.

MORE ABOUT THE BANNER.—Hon. James H. Hawley came down from the basin on Saturday. Mr. Hawley speaks in glowing terms of the Banner district. In the Banner mine the shaft is down 400 ft, revealing high grade ore, containing ruby and wire silver and sulphurets. The 20-stamp mill is kept busy on first class ore, with an average daily result of $1,000 net. This rich district is so completely hidden away in the mountains that very little is known of it.

MONTANA.

ALDER GULCH.—Butte *Miner*, Aug. 25: The Prospect mine, jointly owned by Mr. Layton and S. E. Rice, is looking better than ever. The rich pay streak in the 400 is yielding $2,000 ore, in which gold predominates in the proportion of about $1,100 gold to $900 silver. A winze has been sunk to the 500 level, where the ledge, 14 ft wide, assays 200 ounces. No water has been struck at a depth of 500 ft. The high grade ore is shipped to the refinery, and the low grade will be concentrated at the new works.

HENDERSON GULCH.—Cor. of *New Northwest*, Aug. 24: Mining is active in the western part of Deer Lodge Co. Prospectors are all busy and others coming in every week. Dr. Price S. Gaylord, who came to Montana in 1864, and went back to the States in 1873, returned two weeks ago, and has taken up his old residence in Henderson Gulch, together with his mining property, placer and quartz. He has one quartz lode which he thinks will be a bonanza yet. Twelve years ago he got assays from it which went over $200 in gold. This is the ledge from which the gold is supposed to have come that was taken out of the placer diggings in this gulch.

TIDAL WAVE DISTRICT.—Butte *Miner*, Aug. 22 Everything seems lively now, and prospectors are striking new leads daily. Ore can be found in this camp that assays as high as $6,000 and $7,000 per ton. The gold mill recently erected is having a steady run on ore from the Two Dans and Melrose leads. The first day's run cleaned up over one lb. of gold.

NEW MEXICO.

LAKE VALLEY.—*Southwest Sentinel*, Aug. 22: On Monday, the 20th inst., Frank J. Wright, special master in chancery, sold the Columbia mine at Lake valley, for the sum of $30,500.25 cash, the purchaser being the Sierra Bella.

NOTES.—Las Cruces *Republican*, Aug. 25: The new smelting works at Santa Fe, owned by the Chicago & Santa Fe smelting Co. are completed and will be started up as soon as the contracts for ore are closed. The Leer, Glass & Griffin ten stamp mill at White Oaks is pounding away on gold quartz from the North Homestake. In the Silver Gem they have stopped work in the tunnel, and are working in the shaft, which is down 30 ft, and on mineral quite as rich as the ore in the tunnel. The Black Range mourns over the dullness of its mining camps, which continues in spite of the good prospects for mineral there.

NOTES.—Kingston *Tribune*, Aug. 23: Ten tons of ore from Bremen's '76 mine, Silver City, N. M., averaged $800 per ton. Some of the richest gold ore yet discovered in New Mexico was found in the Pinos Altos range, in Grant county. The ore is composed of quartz and iron, and entirely covered with flakes and nuggets of rich metal. Dr. C. E. Smith and B. F. Kelley have located several claims in the neighborhood of Eckles camp in the Burros, that are looking fine. J. M. Purdy has returned to Socorro from the Black Range. He is preparing to erect hoisting works on the German mine. The official statement of the Treasurer of the Sierra Grande Co. for the first fifteen days of August, 1882, shows $62,956.71 from sale of bullion, and a total for the month of $134,306.33. While this is fair, the month this year shows a vast increase. Alex. Waldschmidt, who represents the New Mexico Silver and Copper Mining Co. on the Bonito, sent specimens to Kansas city for test and recived a return of sixty-five ounces in silver for the lowest grade, and 300 ounces as the highest. The Income Mining Co. will soon resume operations on the celebrated Sherman mine, near Silver city. This property is, with one or two exceptions, the best near Silver city.

OREGON.

NOTES.—Jacksonville *Times*, Aug. 24: Geo. Ross will start up the quartz mill in Blackwell district, there being plenty of water in the shaft. Winters & Sons of Josephine county have about finished cleaning up. The tunnel that taps Geo. Schumpf's ledge in Willow Springs precinct is 310 ft long and the shaft 106 ft deep. Alzono Sturgess, who is working the old Capt. Acorn diggings on Jackson creek, found a crevice not long since which contained $90 of beautiful gold. Will. Brown, superintendent of the nickel mine near Riddle, has returned from San Francisco, where he had a quantity of the ore smelted. He exhibited to us a bar of the metal, which is pure. A correspondent of the *Times*, writing from Josephine county, says that the company mentioned as having struck big prospects on Althouse is composed of John Swan and others. They are prospecting the "big slide," and have got as high as $5 to the pan.

UTAH.

EMMA.—Salt Lake *Tribune*, Aug. 30: A shipment of 15 tons of $160 ore has just been made by the Emma, and we learn that others are to follow. The 135 level is now opened 80 or 90 ft west from crosscut and 125 ft east. The ground is described as the most promising in appearance of any that was ever found in the mine. The vein is 150 ft wide, however. They may run into ore at any moment, and again may pass by and miss it. After being driven a suitable distance the vein will be crosseut from this level at points, enough to thoroughly exploit the ground. We do not know that a share of stock in the Emma Co. is owned in Utah, but the effect of finding a new body of rich ore in it would be such on the mining interests of the Territory, and we might perhaps add, on many men's reputation, that exploitation is watched with the greatest interest.

Examination of the Carson Footprints.

Report of Prof. Geo. Davidson, President California Academy of Sciences—Read August 6, 1883.

Upon representing to the Board of Trustees that more footprints had been laid bare within the State prison limits near Carson, Mr. Gibbes and myself were authorized by the Board to proceed to Carson and make an examination. By arrangement, Prof. W. P. Blake, of Yale College, accompanied us, and promised to make a report of his views. But the work of all was in great measure inseparable, except that Mr. Gibbes remained one or two days beyond our time, in order to make some casts. The descriptions of all can therefore differ but slightly. It is left, however, to each to draw his own conclusions. A detailed description of the locality and of the peculiarities need not be introduced, because they have already been in great measure presented to the Academy by Messrs. Harkness, Le Conte and Gibbes. What strikes the visitor at first is the fact that the friable materials of the two "floors" heretofore referred to are liable to dislocation and

Destruction by Weathering,

Cleaning, and the ordinary traffic of working convicts and visitors over them. And I must confess to some disappointment in not seeing more marked characteristics of the footprints on the lower floor, because in the published drawings there is no varying degrees of designation to footprints that are deeply imprinted, or to those that are barely traceable. Of this, however, I shall speak hereafter. But I was very strongly impressed with the vividness of some of the impressions on the upper floor, and of their teachings; and fearing that they would in time lose their great value in the earth's natural history, I made arrangements with Mr. Frank Bell, the Warden of the State prison, to have them reproduced by making casts of the more important. And here I wish to express the thanks of the party to Mr. Bell for his prompt and intelligent assistance, and for his his generous, entertainment during our stay. To him and his officers we owe acknowledgment for their interest in searching for and preserving every probable footprint, fossil shell, fragment of bone or tusk, and casts of pine cones.

Mammoth Remains and Rain Drops.

One of the first things to strike the eye upon entering the prison precincts, is the thin layer or stratum of hard clay immediately over a thirty-foot stratum of fine blue sandstone. On this clay layer are sharp and deep rain drops or hail markings, which are found even in the faint impresses of a mammoth's feet, leading to a point where the same surface is not marked by such rain drops, but is irregularly smooth, as if lain upon by a huge body some twelve feet in extreme length by about three feet in greatest width. The foot prints are eighteen inches in diameter, and I did not notice any beyond this peculiarly marked spot. In the history of the earlier excavations it is said that a mass of bones was found at this spot, and removed as if of no merit.

And it is also reported that ten years since there was found, at a locality not accurately known, an elephant tusk, or a part of a tusk, which was ten inches in diameter at the base, seven and one-half feet long to the point, which was the thickness of a man's wrist and turned up

Megatheroid Footprints—the So-called Man.

But leaving the fainter and more doubtful marks and tracks which one soon learns to trace out and identify, I come to the two principal series of tracks, important both on account of their size and their preservation.

One of them is the series designated No. 1 in Mr. Gibbes' canvas drawings and in the published plans. This series is in a great measure protected outside the present face of the cliff by a wooden cover which is only raised when visitors are examining the foot prints; but Mr. Gibbes says that these tracks are certainly not in as good condition now as they were before the last winter. And it is reasonable to assert that with every rain, with every frost, every new cast made, every personal examination by inquisitive and sacrilegious hands, these hieroglyphics must suffer in sharpness and accuracy of detail.

The animal which made these footprints appears to have been moving from the cliff outward—using the term cliff for reference only—and since the first visit of Dr. Harkness and Mr. Gibbes and Prof. Le Conte, a short drift or tunnel has been run into the cliff exposing other footprints and also the footprints of a mammoth intermingled.

The indications point to the great probability of the two animals being there at or very near the same time, because one of the footprints of the mammoth obliterates one of the footprints of the preceding animal.

And here it is proper to state that I use the term mammoth provisionally. The diagram designated series No. 1 continued, illustrates nearly to scale this combination of footprints; those only partly exposed are to be uncovered in the casts.

Upon a minute examination of some of the footprints of the first animal or the so-called man, and the material in which these prints were made, a very striking fact was demonstrable.

A lower stratum of mud had been formed, had dried considerably, and the surface was seemingly quite firm, suffering very little impression to be made in it. Above this had been deposited another layer of mud about three-fourths of an inch thick and apparently quite soft. There is no doubt on this point of the two layers, because the upper layer of three-fourths inch is in parts removed and is removable, and is in places lying ready to be swept away, so that there is no assumption of the existence of these two layers. The existence, consistency, and relation of these two layers is very important in a study of the footprints. The foot of the animal in its deliberate walk, and with its great weight, would very easily press from under it all, or nearly all, of the material of the softer upper layer, especially if the lower layer were unyielding or nearly so. And if this upper soft layer were not yet "set" it is very likely that part of the material would settle back when the foot was removed. Moreover, if the lower layer were in that stiff, yet sticky condition which most of us have experienced in walking, riding or driving through adobe soils, there would be occasional lifting up of some parts of that layer by its sticking to the sole of the foot.

Now, upon careful examination, this result is clearly exhibited in several of these footprints; the foot pressed the softer material of the upper layer from under it and rested on the stiffer layer beneath it, and when the animal raised its foot the softer material, though quite soft, was not thin enough to flow back into the print, so that a fair marginal edge may, in some instances, be traced. Again, when that foot was raised, or when the second foot was raised from the same track, it lifted with it an irregular area of unequal thickness from the more tenacious layer beneath. In some places this removed area goes out to the border of the imprint, and in no two instances is it identical in shape or location. Where the surface of the lower stratum is not wholly removed by such adhesion of the stiffer mud to the sole of the foot, there is, in some cases, a narrow border a few inches long and an inch or more in breadth of it smoothed apparently by the slightly forward or backward slip of the foot when lifted, just as would happen to-day to an animal walking over a stiff adobe soil. The soft unctuous character of the upper stratum naturally aided this slipping movement, no matter how little it may have been.

It is these pieces of smoothed, narrow border which have been aggregated to form the sandaled foot of a so-called man. But I am convinced that a study of the facts which are now presented, and the whole appearance of the surface roughened by the lifting of part of the lower stratum, lead to the conclusion that no sandaled foot was necessary to produce the impression indicated. Other facts to be mentioned will sustain this deduction.

Two or more foot prints exhibit other interesting minutiæ of detail. At what may be supposed the heel of the animal's foot, the inner sloping of the soft marginal mud shows distinctly a series of lines as if made by a mass of hair or other similar material attached to the foot; and at what may be supposed may be the toe end of the animal's foot, the inner sloping of the same layer of softer mud indicates that when the foot was lifted the forward part had a slight movement inward.

I examined these markings carefully to see if, by any possibility, minute remains of hair or other material might be still attached to the mud. And where so much of interest is centered it seemed exceedingly important that a member of the academy should be present whenever any new drifts are to be made because the minutest details should be gathered. This was carried out at the opening of the last two mammoth tracks, when Dr. Harkness and Prof. Joseph Le Conte and Mr. Gibbes were present.

In this series of tracks it may be safely asserted that there are no two which are exactly alike in outline or imprint, whatever significance may be attached to that fact.

In the line of these tracks, or at least in the pathway of 20 of them, reckoning from the half-exposed one in the drift, there are no other tracks except the three or four mammoth tracks at the drift, or tunnel under the cliff, and some bird tracks from the heel of the ninth to the toe of the tenth animal track. These bird tracks will be referred to hereafter.

This series, as heretofore described, is on the "upper floor," two feet above the "lower floor" of the published diagrams, and on the same "upper floor" are the imprints of the mammoth line. This series has no designating number in the published diagram.

Footprints of the Mammoth, or Elephant

In the series of mammoth tracks, and I think we may safely assume them to belong to some species of elephant, I selected a line of ten for casts. These tracks are not of uniform depth on account of the partial destruction of the different layers of mud through which the animal's feet pressed. Those imprints farthest away from the present face of the cliff are discernible through the lowest layer of mud; and they rested upon a subsurface ripple-marked stratum without obliterating or changing any of the ripple marks. This substratum had, therefore, been hardened before the animal walked over it. As we approach the face of the cliff the imprints are more distinctly exhibited and we are able to measure the inside diameter of the foot at right angles to the line of march at 21 or 22 inches. Between the fourth and fifth imprints, reckoning from the last ones exposed in the drift or tunnel under the cliff, there are footprints of the same species of bird which has marked the surface in so many places.

The two last exposed mammoth footprints are within and under the cliff, and although the outer one is not so perfect as the inner one, yet each indicates that the foot pressed through about four inches of mud and raised a moderately broad margin of one inch in height, thus making the apparent depth five inches; and this depth was not in one layer of mud, but at least two are indicated by the annexed drawing. These are the two tracks which were first exposed to Dr. Harkness, Mr. Gibbes and Prof. LeConte, and described by them.

In the outside tracks there is nothing to indicate in which direction the apparently round-footed animal was moving; but in the two best preserved examples there is a decided duplication on the margin of each in the line of march, but not extending to the depth or the breadth of the whole foot. The footprint exhibits the exposed addition as a segment having a chord of about one-third of the diameter, or less than one-half the diameter, of the main imprint. Each of these two principal footprints is twenty inches across at right angles to the line of march.

I examined carefully for finer markings on the margins of the prints, but could see no evidences of any other indentations as if from toe-pads, etc. This addition at the margin either indicates the duplication of the footprint, or it affords a clue to the shape of the foot. The hind feet would appear to have stepped into the print of the forefeet with great regularity, but I could see no evidences of any other indentations, as if from toe-pads, etc.

It would be extremely interesting to have at least two more of these footprints exposed, and that the members should again scrupulously and minutely examine them when they are brought to light, and at once obtain casts under the most favorable conditions of freshness, etc.

Tablets of the Footprints to be Made.

These two series of great footprints just described seemed to me so valuable in paleontological investigations that I laid down a plan to reproduce them as nearly as practicable in their present condition and relation. For this purpose Messrs. Blake and Gibbes and myself have measured a line through each, and at each footprint in the first series described, and including the well marked birds' tracks, a series of determined offsets indicated by drilled holes, has been so arranged that each plaster cast will contain two of these holes, and each footprint will be numbered.

From these casts we hope to be able to reconstruct, in sections, a tablet for series No. 1, not less than forty-six feet long and three feet wide for the greater part, and about six feet wide at the part under the cliff, where the two animals crossed in their march.

In the line of mammoth tracks, a central line was laid down, and offset measures will be made at each imprint to properly locate and orient the same. The length of this series will be about forty feet, and should two fresh tracks be uncovered, it will reach forty-nine feet in length.

That these representations of the actual tracks will be of great importance, goes for the saying; and already inquiries have been made for copies on behalf of the Smithsonian Institution, for the museum at Paris, for the Central Park, New York (through D. O. Mills), etc. This work is now being done under the direction of Mr. Frank Bell.

Length of Stride, etc.

As determined by Mr. Gibbes, the pathway of the mammoth tracks is about thirty-six inches broad, and the breadth of what has been denominated the straddle is nineteen inches. My measures of the average longitudinal distance apart of the imprints of the eastern steps is, for five spaces, eight feet eight inches, and for four spaces of the imprints of the western steps, is eight feet nine inches. The imprints are not evenly separated, the range being nearly two feet.

For the quadruped of the first series, the so-called man, the longitudinal distance apart of the imprints of the right feet for nine spaces is four feet ten inches, and for nine spaces of the left imprints, four feet nine inches.

I did not measure the breadth of the straddle of this series, being satisfied with Mr. Gibbes' previous measurement of nineteen inches, which is the same as that of the mammoths.

Footprints of the Elk.

The next series of tracks that we measured were those which Prof. Blake and myself provisionally, and for reference only, have denominated the elk. But there is no proof whatever that they were made by an elk. We could not make out any one footprint specifically, because the mud layer had been too soft and deep, and the animal evidently had sharp feet, or hoofs, which went down deeply, as if the animal were quite heavy. But we felt satisfied of the direction in which the animal was moving. We did not preserve the strict line of march of the animal, but measured the distance apart of the consecutive imprints and the breadth of the straddle.

The imprints appear to have been made by a second foot treading in or very nearly in the track of the first. The prints average 4½ inches long and 3½ inches broad. The breadth of the straddle is 13 inches, and the longitudinal distance apart of the imprints of 7 tracks on one side is 6 feet 2 inches, and of 6 tracks on the other side is the same.

The diagram exhibits the distances measured from one footprint on one side to the next footprint on the other side, and these distances are laid down for an average pathway. Five feet from the line of the above prints were footprints which might have been made by a deer or some similarly cloven hoofed animal.

(CONCLUDED NEXT WEEK.)

Forestry Notes.

The Forestry Congress which recently assembled in Wisconsin passed a resolution recommending the establishment of an Arbor Day in each of the United States and Canada. What is meant by Arbor Day is some suitable day appointed by the Governor of a State upon which there is a universal planting of trees on one's own land by the owners, in parks by corporations, in school grounds by school boards and pupils—in short, so general attention to the subject of tree planting as shall work favorably in what is called village improvement, the cultivation of different species of trees by farmers as crops, the beautifying of highways, etc. Some States already have Arbor Days, and the institution works well and leads to the planting of many trees. There has been some agitation of the subject in this State, and some effort in the right direction. The Congregational Church of Berkeley observes Washington's birthday as an Arbor Day by meeting in the afternoon for the planting of trees, shrubs, flowers, etc., upon the church grounds. Washington's birthday, in the greater part of California, is well placed for tree planting, and the close connection of a tree with the early history of the great patriot makes such a ceremony on his birthday quite appropriate.

The Forestry Congress also recommended that the members represent to the States the necessity of establishing forestry experimental stations and memorialize the legislatures of the different States, urging upon them the practicability of establishing these stations. The report also recommends that experimental stations center in the agricultural colleges.

The committee on memorializing State legislatures upon the establishment of State forestry commissions reported memorials, calling attention to the importance of giving early attention to measures for the maintenance of forestry supplies, and to the relations existing between a due proportion of woodland and agricultural welfare of the country, water supply, etc. In view of the fact that the most settled portions of the country were owned by individual proprietors, the report states that the most effective way of promoting tree culture is the diffusion of correct ideas among the owners of land. This end would be best achieved by the appointment of State commissions to introduce a new variety of trees, keep people informed on the best method of tree culture, establish nurseries and experimental stations, and hold meetings. In this connection it is of interest to state that forestry is not being neglected by the Republic of Mexico. An exchange says:

The government has lately contracted with Mr. Oscar A. Droege to plant 2,000,000 trees in the valley of Mexico within four years from March 15, 1884—500,000 a year—in such places as the government shall choose. The contractor pledges himself to establish a number of nurseries and to have in them each year at least 800,000 ash, 35,000 willows, 120,000 poplars, 60,000 encalyptus trees, 60,000 trenos-japones, 60,000 mountain cypress cedars, 60,000 acacias, and 120,000 of miscellaneous varieties. The trees must be in plantations of from 50,000 to 100,000 each, and Mr. Droege has to maintain them for two years after planting. He is not compelled to plant trees along the highways, however. Three graduates of the School of Agriculture are to be received into the nurseries each year, there to study the science of forestry. He is also to raise fruit and other useful plants for free distribution. The contract also provides for the translation from the German of a recognized work of merit on forestry. An inspector is to superintend, and Mr. Droege is to receive annually $40,000 till the sum reaches a total of $200,000.

A BIG IRON MINE.—The Sierra Valley (Cal.) *Leader* learns from reliable authority that the great iron mine near Mohawk valley is about to pass into the hands of a syndicate of Boston capitalists, who propose to proceed to develop it. It is undoubtedly the largest body of iron ore on this coast, and is inexhaustible, and further than that, the quality is better than any ore in the United States, being the same as that from which the celebrated Russian and Swedish iron is made. It has been lying idle because there has been no means of transporting its products, but now a railroad is proposed from some point on the Central Pacific, to run through Sierra valley, tapping its agricultural resources and the immense tracts of timber in the vicinity, and thence into Mohawk valley and the mine. A surveying party may be set to work this fall making the preliminary surveys, and it is thought that within two years the mine will be turning out its products to the world.

WHEN Sherman fought and won and the news came into a distant desolate country in Idaho, the old miners said it was "a big thing." The discovery of a new ledge from fifty to seventy-five feet wide was also "a big thing," and so the ledge took the name "Atlanta," and the town was thus called from the ledge. A number of mines are located on this ledge. The largest, perhaps, is the "Atlanta." It has large hoisting and pumping works, a shaft 400 feet deep, a mile or more of drifts and tunnels, two mills, and has taken out more than $1,500,000 in gold and silver ore of a high grade. The ore bodies now uncovered are immense. A new mill will be put up early next spring with increased facilities for reducing ore.

THE ENGINEER.

New Forms for Boats.

Two boats have been recently chronicled in the papers which make in each case a decided departure from the old type, and we may say the stereotype, which has to a certain extent ruled all ship building from the day of Noah down. For much as models vary, they all seem to be planned on one principle—the boat must take *deep* hold of the water; and especially is this held to be true in the rough service of the open sea. In any one, for instance, of our splendid ocean steamers, her breadth of beam does not much exceed one-tenth of her length, and of course, therefore, her draught is so great that Sandy Hook scarce gives water enough to float her without watching for the tide.

Now, is this necessary? Are we bound to go on in the same way, or is it one of the nursery legends which have come down to us by inheritance, and with which, when we learn to go it alone, we can dispense? The two plans of boats to which reference has been made turn our attention toward this matter.

The first one was evidently intended only as a pleasure boat, and to be of small size, but it was original in its design. It was to have the general proportions of a catfish, that is, the bullhead of Connecticut, or bull-pout of Massachusetts, the *Amiurus nebulosus*. This brings the bow broad and flat, the breadth carried very well forward, and gently rounded up only, while aft it tapers to a narrow waist and wedge like stern, with nothing there to make her drag water in the least. The greatest breadth, away out, quite near the bow, will be about one-fifth the length of keel. What this peculiar build will do remains to be seen. It is certainly unlike any ordinary model, and it is much to be hoped that its results, whether satisfactory or not, may be made public. The trials which fail are of perhaps the most interest and advantage to everyone except the originator.

In the second case there was not absolutely anything new. It was a small steamer constructed for a sugar estate on the Magdalena river, and to secure a sufficiently light draught her beam was about one-fourth of her length, with full bearings carried well fore and aft, yet without a really flat bottom, fine lines being her general characteristic. With a length of 54 feet her extreme draught is to be only two feet.

No one can stand well forward and watch an ordinary steamship as she is plunging into a heavy head sea, without being conscious of the terrible strain which comes upon her, as she berries herself in the next sea before she begins to rise. Her sharp bow cuts into it like a knife, and away she goes down, down, before her displacement is able to overbalance her weight and downward pludge, and then she lifts and goes over. If now, instead of this knife edge she had the breadth forward which would have rendered impossible any such depth of submersion, whose amount of displacement would have sent her over the coming sea, when instead of plunging thirty feet down into it she had hardly buried herself a fathom, what laws of hydrodynamics will show that in the latter case a decidedly important part of the strain upon her timbers would not have been avoided. *Scientific American.*

DEVICE FOR DISCHARGING WATER FROM SHIPS.—A successful trial was made a few days since, in New York harbor, for discharging water from ships without pumping. The invention consists of a valved tube which passes through the hull of the vessel, at or about midships. The tube is arranged to be pushed down outside of the hull when in use, and withdrawn even with hull when not in use. The tube carries a valve, by opening which communication between the inside of the hull and the water outside may be established. The extremity of the tube, looking toward the stern of the vessel, has an orifice, but the front portion of the tube is solid. When the tube is pushed down through the ship's bottom, the forward motion of the vessel will produce a suction in the tube, and if the valve is opened the water in the hull will be drawn out.

The inventor expects that sailing and steam vessels may be kept dry and prevented from sinking by simply adjusting the tube and valve as above indicated. On the recent trial here the valve was applied to an old scow sixty feet long, towed by a tug. The valve was opened and water was allowed to flow in and fill the scow until it was almost ready to sink; the tug was then started, and under a speed of three miles an hour the scow was in ten minutes relieved of its water in the manner described.

A NEW ROAD TO THE SEA.—The practicability of a through line of rail from Minneapolis to the eastern seaboard via the Sault Ste. Marie, has been discussed for years, and the feeling has been general among railroad men and others competent to judge of the cost of such a line, and aware of the immense traffic awaiting it, that it would sooner or later be constructed. At last the project has taken definite shape and articles of incorporation of the Minneapolis, Sault Ste. Marie & Atlantic railway have been filed in Madison under the laws of Wisconsin. The capital stock has been fixed at $12,000,000, and of this amount a large portion has been subscribed for by the board of directors, which includes some of the largest business men and capitalists of the northwest.

USEFUL INFORMATION.

Steaming and Bending Wood.

The process of forming the crook or curl for walking-canes which are not naturally supplied with a knob or hook, is thus described: The workman places one end of the cane firmly in a vise, and pours a continuous stream of fire from a gas-pipe on the part which is to be bent. When sufficient heat has been applied, the cane is pulled slowly and gradually round until the hook is completely formed, and then secured with a string. An additional application of heat serves to bake and permanently fix the curl. The under part of the handle is frequently charred by the action of the gas, and this rubbed down with sandpaper until the requisite degree of smoothness is attained.

In an address recently delivered by Mr. H. G. Shepard, of New Haven, Conn., relative to the use of wood in carriage making, he said that after a piece of wood is bent its characteristics undergo a considerable change. The wood is heavier, and its fibers have become interlaced. It will sustain more pressure and strain than straight wood in the same directions, either across or with the grain. He said: A piece of timber that has been steamed, whether it is bent or not, has its stiffness increased. It is more brittle than it was before, and for some uses it will do as well, and yet there is a quality that the steaming process and the kiln-drying process affect very much the same; they both cook the gum in the timber and make it brittle and stiff. There is a grade or class of hickory that is benefited by being steamed or kiln-dried for use as spokes or whiffletrees. There is a kind of hickory that never becomes stiff by natural process of drying, and one of the desirable qualities of a spoke, rim, or whiffletree is stiffness, as well as strength. You take that hickory—and it is the very best we have—and steam it, and it is better fitted for these purposes than it was before. It is difficult to tear apart a piece of bent wood; the fibers are interwoven one with the other. We do not perceive the change on the outside, but when we come to split the stick open, we find that its character is entirely changed.

PRESERVING TIMBER.—According to experiments made upon the Hanover, Cologne and Minden railway, fir sleepers injected with chloride of zinc required a renewal of twenty-one per cent in eleven years; birch sleepers injected with creosote required a renewal of forty-six per cent at the end of twenty-two years; oak sleepers injected with chloride of zinc required a renewal of about twenty-one per cent at the end of seventeen years; while the same kind of sleepers in their natural state require a renewal of at least forty-nine per cent at the end of a like period. The conditions in each of these cases were very favorable for obtaining trustworthy proofs. The subsoil of the line was good; the non-renewed sleepers showed, when cut, that they were in a sufficiently good state of preservation. Upon another line, where the oak sleepers were not injected, it was necessary to renew them in the proportion of seventy-four per cent at the end of twelve years; these same sleepers, injected with chloride of zinc, required a renewal of only 3.29 per cent at the end of seven years, whilst those injected with creosote required a renewal of only 0.09 per cent at the end of six years.

OLD SHOE LEATHER.—You probably think, if you look very sharply at an old shoe when you throw it away, you will know it again if it ever comes back to you. But that doesn't at all follow. One of these days you may button your dress with an old pair of slippers you once owned, comb your hair with a boot, or grasp a cast-off gaiter while at your dinner. This is not romance, for old shoes are turned to account by manufacturers in the following manner: They are cut into very small pieces, and kept for a couple of days in chloride of sulphur. The effect of this is to make the leather hard and brittle. Next the material is withdrawn from the action of the chloride of sulphur, washed with water and dried. When thoroughly dry it is ground to powder, and mixed with some substance like glue or gum, that causes it to adhere together. It is then pressed into molds and shaped into buttons, combs, knife-handles, etc.

LUMINOUS PAINT.—White luminous paint has been known for some years, and chiefly used for watch dials, match boxes and other small objects, but all attempts to produce luminous paints of various colors have hitherto failed, owing to the fact that the sulphate of calcium, the principal constituent of luminous paint, is decomposed by the metals contained in the usual colors, whereby not only the luminosity, but also the color is destroyed. Lately, however, G. Schatte, of Dresden, has succeeded in producing red, blue, green, and otherwise colored paints, which have the quality of shining in the dark with the same color which they possess in the daylight. It is easy to see that a variety of artistic effects may be produced by means of such colors.

A PERPETUAL CLOCK was started at Brussels a little over a year ago. An up-draft is obtained in a tube or shaft by exposing it to the sun; this draft turns a fan, which winds up the weight of the clock until it reaches the top, when it actuates a brake that stops the fan, but leaves it free to start again after the weight has gone down a little. At the last of June the clock was running perfectly, after having been in motion for nine consecutive months.

MAHOGANY SPURS.—A writer who has made a study of the mahogany tree, says: A peculiarity of the mahogany tree, of which very few have knowledge, is seen in the numerous spurs, which are thrown out from the body of the tree at regular intervals from the ground up the tree to the height of twelve feet or more, all of which grow downward like roots, and finally enter the earth and become real roots. These spurs, often from twelve to sixteen inches in diameter, are incomparably superior to any part of the trunk for beauty of texture and color. These spurs are rarely cut by the loggers, on account of the great labor necessary, to avoid which the axemen built a hasty scaffolding of sufficient height to enable them to cut off the tree above the spurs. So highly are these secondary roots valued for their beauty of grain and color, that of late years dealers are having them cut for the market as an extraordinary prize. Some of these mahogany spurs have been sold for $250 per 1,000 feet board measure, while the body of the tree brought but $40 at the port of exportation.

A NEW INVISIBLE INK has been introduced by Dr. Widemann. It is made by intimately mixing linseed oil one part, water of ammonia 20 parts and water 100 parts. The mixture must be agitated each time the pen is dipped into it, as a little of the oil may separate and float on the surface, from which if taken up by the pen a stain would be left upon the paper. To make the writing appear, all that is needed is to dip the manuscript in water; when the paper dries the writing will vanish.

A BRILLIANT black can be produced, it is said, on iron and steel, by applying, with a fine hair brush, a mixture of turpentine and sulphur, boiled together. When the turpentine evaporates, there remains on the metal a thin layer of sulphur, which unites closely with the iron when heated for a time over a spirit or gas flame.

A SPECIES of spider has been discovered on the African coast, the long firm web of which very closely resembles yellow silk. It is said to be nearly as good as the product of silkworms. The filaments have been examined by Lyons silk merchants with favorable results. There seems to be nothing to prevent the acclimatizing of the insect in France.

COLORING DIAMONDS.—It appears that if common yellow African diamonds are immersed for a few minutes in an aqueous solution of aniline violet, they acquire a fine steel blue tint peculiar to the best stones.

GOOD HEALTH.

Sea Bathing.

At the present time, says the *British Medical Journal*, it may be useful to recall the chief general indications and contra-indications which respectively sanction and forbid bathing in the sea. "Shall I bathe?" This is a question which thousands of health seekers will be asking of their doctors during the next few weeks. While the stimulus of a fresher air, of change of scene, and of new occupations, together with rest from accustomed work, are the elements from which the weakly, the worn, the worried reap physical and mental restoration in a sojourn on the sea coast, it is unquestionable that bathing in the open sea is, in itself, a powerful restorative agency, which many persons may employ with very great advantage.

The universal experience of our race, through unnumbered ages, has shown the value of sea bathing in both preventive and curative medicine. A good rule, laid down by an experienced physician, is this: In all cases showing impaired functional powers, without any manifestation of inflammatory symptoms, in short, in those cases in which the exhibition of alteratives and tonics is indicated, sea bathing may, with proper precautions, be resorted to; it is contra-indicated in persons of plethoric habit of body, in cerebral congestion, in organic disease of the heart, in aneurism, and in all persons who have the imiability safely to encounter a comparatively severe shock; while it is also to be forbidden at certain periods in which the female constitution is not prepared for the application of powerful remedies. Because it tends, in certain conditions of impaired health, to cause determination of blood to the viscera. Bathing in the open sea is generally unsuitable for persons disposed to congestive disorders of the lungs, kidneys, liver, and brain.

It is hurtful to bathe babies in the sea; children under two years of age are too young to bear with advantage the comparatively severe shock of a cold sea bath. In old age, when the bodily powers are unequal to a vigorous reaction, sea bathing may do much harm, especially in the subjects of extreme arterial degeneration. In suitable cases, and under proper precautions as to time of bathing and duration of exposure, a daily bath in the open sea is a valuable restorative. In individuals who are fairly robust, it is a stimulant, alterative, and tonic, promoting appetite, tissue change, and excretions, and bracing up the nervous, vascular, and muscular systems. Sea bathing is especially useful as a powerful and unsurpassed tonic in delayed convalescence from acute diseases, in many chronic affections, and in persons whose strength has become enfeebled by injurious excesses, by mental strain, or by unhealthy occupations.

Take Care of the Children.

Much may be done to prevent the croup by the exercise of good judgment in the care of children. Some parents make their children very sensitive and delicate by excessive prudence. A child kept in the house and treated like a house-plant can hardly be prevented from encountering a rude blast of wintry weather by the oversight of some one having the care of it. It is better to toughen the child by clothing it warmly and giving it a good airing every day, either in walking or riding. The mistake should not be made of putting fur or woolen about the throat. Toughen the throat as you do the face. Be sure that the extremities are as warmly clad as the trunk of the body. See to it that the shoes are made to exclude snow water, and still avoid the use of rubbers, unless, if necessary, a pair of low sandals be used to protect the soles of the feet. One more hint to overprudent mothers: Do not cover the child too warmly when put to bed. Nothing is more liable to give a child a cold than to be muffled in too many blankets or spreads of some kind, for as soon as it gets into an uncomfortable perspiration it will free itself from the cumbrous covering, and then by a sudden checking of the perspiration, contract a cold. There is absolutely more danger from excessive than too little covering.—*Dr. Foote's Health Monthly.*

POISON IN FLOUR.—A mysterious illness has been disturbing a small community in France. One member after another sank, while presenting the usual appearance of lead poisoning, without any apparent cause. The doctors who were called in could not make much of the symptoms, except that they seemed to proceed from some food which had been taken. By a process of inductive reasoning, and by exhausting the causes which were found to have operated upon all the sufferers, suspicion at last fell upon the bread. An examination was accordingly held at the bakers' premises, but they, having been found blameless, the inquisitors next proceeded to attack the miller, and here, at last a diligent inquiry brought to light the cause of all the mischief. Finding that his millstones had cracked in some places, and that the purchase of new stones would be somewhat costly, the miller had adopted the plan of filling the chinks with melted lead. The lead had, in the course of grinding, naturally got mixed with the flour, and had so found its way at last into the loaves distributed to the population. The tale is interesting as showing the pertinacity of particles of lead in clinging to any substance with which they may get mixed. It is still more noteworthy than the case of lead poisoning which occurred in Paris not long ago, when it was found that a baker had warmed his oven with old wooden boards that had been painted with white lead, and that the residue of the lead lying in the oven had penetrated into the crusts of loaves.—*The Continental Gazette.*

THE FATAL CRAMP.—A writer in the *British Medical Journal* calls attention to the frequent notices of death, by cramps, of bathers, and suggests some preventives—remedies are in these cases too late. He says that cramp is a painful and tonic muscular spasm. It may occur in any part of the body, but it is especially apt to occur in the lower extremities, and, in its milder forms, it is limited to a single muscle. Pain is severe, and the contracted muscles are hard and exquisitely tender. In a few minutes the spasm and pain cease, leaving a local sensation of fatigue and soreness. When cramp affects only one extremity, no swimmer or bather, endowed with average presence of mind, need drown; but when cramp seizes the whole of the voluntary muscular system, as it probably does in the worst cases, nothing, in the absence of prompt and efficient extraneous assistance, can save the individual from drowning. Its most powerful and most avoidable cause is the sudden immersion of the body, when its surface is highly heated, in water of a relatively low temperature.

CATCHING COLD.—How can a man "catch cold" in a Pullman in July? Simplest thing in the world. Sit still most of the time for a week, and eat "as much as you want" every five or six hours. Don't restrict yourself to simple food, as fruits, with a little coarse bread, for example. When the feeding stations are reached don't devote the half hour to walking up and down the platform, swinging the arms well so as to exercise the body all over, encouraging the excretory system to keep the body clean, but join the crowd in their rush for an excessive quantity of hot fried stuff, wheat starch bread, "pie," and hot slops. Eat till the bell rings for "all aboard," then rush back into the unventilated car and sink down in a corner, doubled up in a heap, and sleep off your surfeit. You are pretty certain to "catch" something by the time you land in New York. Why not call it "a cold?" Sure enough!

FOR poison ivy, bathe the parts in a decoction of hemlock boughs, or of oak leaves, or with a teaspoonful of copperas (sulphate of iron) in a small teacupful of boiling water; or rub wet salt on the affected parts. If the blisters are broken, one application of niter will be sufficient.

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Passing Events.

There is uot much of interest to report from the mining regions of the coast aside from what we have noted in our "Mining Summary." Winter will soon be with us, and the prospectors will shortly begin to come into winter quarters. There have been no very remarkahle strikes this season, though, of course, very many new locations have been made. It is probable that next summer will see more prospectors in our northwestern regiou thau ever before.

The northern States of Mexico are coming more and more into notice as mining fields, aud the gradual increase of tbe American element in the region is awakeuing it so that better progress will be made.

As details come to hand of tbe great earthquake which has altered the straits of Sunda for navigable water to shoals, it is seen that this is the great world-change of modern times. Thousands of people have been killed and the whole face of the country altered.

AMERICAN NEWSPAPERS.—According to the "American Newspaper Catalogue" of Edwin Alden & Bro., Ciucinnati, Ohio, just published, containing over 800 pages, the total number of newspapers aud magazines published in the United States and Cauada is 13,186, showing au inerease over last year of 1,028. Total in the United States, 12,179; Canadas 1,007. Published as follows: Dailies, 1,227; Tri-Weeklies, 71; Semi-Weeklies, 151; Weeklies, 9,955; Bi-Weeklies, 23, Semi-Monthlies, 237; Monthlies, 1,324; Bi-Monthlies, 12.

San Bernardino County Minerals.

Although San Bernardino has long heen known as a mining county, no very extensive operations were carried on there until within the past few years. Some minerals are found there which are produced nowhere else on the coast. In the future this county will appear to better advantage in summing up all that relates to miuing. At the State Mining Bureau, the two cases devoted to the county contain enough to convince the most skeptical, that for variety of uineral products and richness of ores, San Bernardino takes high rank.

In the collection referred to are several specimens of tin ore from the Temescal tin mine and San Jacinto mine, donated by L. Franconi and the Temescal Tin Co. This is the only tin fonnd anywhere in the United States in any quantity. There is also a collection of ores from the King mine, Calico district.

There is a magnificent specimen of ore from the Copper World mine, Clark mining district, eighty miles from Daggett. Specimens of magnetite, also of pyrolusite and rhodonite from near Colton. McIntosh & Co., silver ore from Wm. Utter; sulpbate of baryta from Calico district, Sol. Heydenfeldt, Jr.; selenite, from Calico, John Daggett. The coal exhibited was brought by Mr. J. R. Scupham, from Cajon pass; it contains (by analysis) water 9.67, volatile hydro-carbon, 27.67, fixed carbon 46.53, ash 16.13. A piece of chalcedouy from Soledad canyon is exhibited hy Henry Sherwood. Crystallized gypsum from near Calico district; white dolomite from Amargosa wash, J. H. Colerich; satin spar from H. G. Maynard, fossils occurring with the coal mentioned above; lepidolite from twenty miles southwest of Colton, G. Kerstel; silver ore, San Francisco mine; silver ore, Resting Springs, Wm. Masher; mica schist, Ivawatt district, W. S. Keys; silver ore, Leach mine, Ord district; azurite, New York district, Hugh McCormick.

One of the unique specimens is a large borax crystal, probably the finest crystal that has ever heen fouud in the State. It differs from those found at Borax lake, Lake county, in being free from the inclosed mud which renders them opaque. Mr. E. M. Skillings donated this specimen. Tincal, State range, H. G. Hanks. Letharge from W. D. Brown. Crude material from the borax deposits. Selenite from Calico district, S. Heydenfeldt, Jr. Mineral water from the "Anti-fat Spring," W. T. Garratt.

There is a fine collection of copper ores from Clark's mountain, donated by E. Clark, of Calico. Galena, donated by Jno. Skinker. Silver ore, Resting Springs, W. G. Lent. Asphaltum pierced by shells, a very curious specimen, H. G. Hanks. The nitrate of soda from the cave in Calico district was given by W. B. Murdock. Not known to exist in auy large quantity.

There is a large collection of ores from the different levels of the Belle McGillivray mine, Providence mountain, Thomas Ewen. Rich gold rock, Pinacate district, twenty-four miles south of Calico, J. R. Scupham; silver copper ore six miles from Lane's Crossing, Wm. H. Moore; silver ore, Great Eastern mine, W. S. Keyes; silver ore, San Francisco, Ivawatt district, W. S. Keyes; silver ore, very rich, showing cerargyrite, Queen mine, Calico, John Daggitt; ore from Gold Mountain miue, W. H. Watson; silver ore, Oriental mine, Calico mountain, James Walsh; silver ore, Occidental mine, Calico, S. Heydenfeldt, Jr.; silver ore (embolite), Grapevine district, H. G. Maynard; silver ore, Occidental mine, Calico, Chas. M. Tyler; silver ore, King mine, Calico, C. M. Tyler; silver ore, Golconda mine, Calico, Mrs. Townsend; silver ore, Silver King district, Calico mountain, H. G. Maynard; silver ore, Burning Moscow mine, Calico mountain, Chas. M. Tyler; free silver in gangue of barite, Waterman aud Porter mine, Grapevine district, J. S. Waterman; silver ore, Geneva mine, C. M. Tyler; silver ore (with native silver in calc spar and barite), San Gabriel mine, C. M. Tyler; silver ore, Veto mine, Calico, Chas. Kaufman; embolite, Plntarch mine, Calico district, John Daggett; rich silver ore coated with emholite, Garfield mine, Calico district, John Daggett.

NEXT to iron, copper is the most useful metal in the world. In its general distribution, it comes next to that most important of all metals. The qualities of durability, malleability, ductility, etc., it possesses, render it adapted to a great variety of purposes.

Life Brigades for Mining Districts.

We have before spoken of the project of providing life hrigades for mining districts, so that in case of accidents underground all the necessary appliances would he at hand ready for immediate use. The idea origiuated among the English coal fields. There are several forms of apparatus by means of which men may enter deadly and explosive atmospheres. Colliery fire pumps are constructed to run in any gauge of railway underground, and are readily adjusted. Steam fire engines to get up steam in a few minutes are not very expensive. Mr. Alar Bagot, a mining engineer who has given much attention to the welfare of miners, says the estimated expense for equipping a brigade in each district is £800, and an annual outlay of £100 for maiutenance in renewals. A station thus equipped would protect an area of thirty miles around it. The men would be drawn from tbe mine where the accident occured, only two men coming with the trucks containing the apparatus, very much as the breakdown gangs are collected on the railway. Tbus local and intimate knowledge of the workings of the mine, with a knowledge of the nse of the apparatus, are secured. The certificated managers of the various collieries in the district should be taught the nse of the appliances, and any others of the engineering staff, such as mechanical engineers, deputies and firemen; each proficient man should be supplied with a distinctive badge, and every colliery should be supplied witb a list of the brigade. Each colliery should be visited in turu by the meu in charge of the appliances, and the miners should be drilled periodically by a committee of the mining engineers of the district.

Against the cost of annual maintenance a small sum might be written off by rates for local fire brigade service. It will be observed that, as in the case of the lifeboat service, everything depends npon the courage of those who have to use the appliances; hut, as we have had instances where the exploring parties have beeu suffocated sooner than give up the attempt to save the snrvivers, we can have very little apprehension how they would behave were they equipped with appliances to enable them to carry out their object with comparative safety. What owners of colliery properties should bear in mind is, that if the workings of a mine are filled with choke-damp, entrance, except hy the aid of aerophores, is impossible, and that it is not right that such appliances should not be available in mining districts. Further, that accident is as costly to the owner of a mine as to the lessees, and that the system of life brigades proposed here is an alternative and less expensive scheme than that of each mine having its own appliances.

New Amalgamator.

A new form of amalgamator has lately been invented which has some curious features. A hopper is secured to a frame, and adapted to receive earth, pulp or sand. Attached to the lower part of the hopper is a suitable tube or chamber, in which a screw is made to revolve by any suitahle power which is applied to the outer end of the shaft. The shaft is journaled in the frame and the end of the tube. The screw serves to feed the earth or reduced ore from the hopper directly into a tube.

This tube is made of a number of separate and distinct sections, each one of which is made so as to have an abrupt shoulder formed at its largest point. This shoulder serves to hold mercury, which is to be placed in each section, so as to catch the precious metal from the earth or sand passing through the tube as it is caused to revolve with the screw. In each section is also placed an amalgamated plate. The tube is placed at a suitahle incline, so that the earth or pulp will flow constantly through without clogging.

This machine, the inventiou of C. E. Topping, of Socorro, N. M., is intended to be used eitber with dry earth or quartz, though water may be used. With water, the mud in parts, in flowing through, will allow the heavier portions to settle into the mercury and form amalgam more quickly than by the dry way. The incline of the tube and its revolving motion dispense with the necessity of a head of water to force the pulp through. In cleaning np, each section can be removed separately and the mercury and plates removed.

Magnetic Ore Separator.

Some time since we described a maguetic ore separator invented by Thomas A. Edison, who has since, however, hit upon another plan for separating magnetic from non-magnetic substances. The new plan has the same object, but is intended to be nsed with sluices. The dirt, sand, etc., with the water, enters the upper end of the inclined trough or sluice, beneath which are placed magnets. The trough may be of any desired material; if of magnetic material—as iron—it forms polar extensions of the magnets; while if it be of nonmagnetic material, the magnets act therethrough sufficiently to accomplish the desired result.

The horseshoe magnets are preferably electro-magnets energized through conductors from any suitable source of electricity. They are arranged in series or placed in multiple-arc or derived circuits.

The pulp, earth or sand passes down the sluice, and when it comes within the influence of the magnet, the magnetic substances are attracted and a portion of them are held to the hottom of the sluice, while the rest passes on to the next magnet. A suitable number may be employed to separate all the magnetic substances.

Permanent maguets instead of electro-magnets may be used, though the latter are best. The construction involves the greatest simplicity, aud permits the charge of any ordinary sluice-box into a magnetic separator without any cutting or fitting. Both the sluice-box and magnets being stationary, the iron particles are held in place and act as riffles to retard the gold. The sand, etc., flows on to the end of the sluice. The gold and magnetic substances can then be collected and separated. The peculiar method of forming riffles by tbe maguets collecting the iron sands, form one of the important features of Mr. Edison's patent.

Mine Ventilation.

In Great Britain they have very stringent rules on the subject of ventilation in colheries, so that mine owners and managers shall not by carelessness or parsimony be the cause of accident. When accidents do occur, the certificated managers are overbauled and the blame placed where it belongs; aud moreover, the culprit is punished. The Miner Regulation Act is on these points quite strict. The first rule provides that "an adequate amount of ventilation shall he constantly produced in every mine to dilute and render harmless noxious gases to such an extent that the working places of the shafts shall be in a fit state for working and passing therein." The second rule provides that "in every mine in which inflammable gas has been found within the preceding twelve months, then once in every 24 hours if one shift of workmen is employed, and once in every 12 hours if two shifts are employed during any 24 honrs, a competent person or persons appointed for the purpose shall, before the time of commencing work in any part of the mine, inspect with a safety-lamp that part of the mine, and the roadways leading thereto, and shall make a true report of the condition of the ventilation; and no workman shall go to work in such part until the same, and the roadways leading thereto, are stated to be safe. Every such report shall be recorded, without delay, in a book which shall be kept at the mine for the purpose, and shall he signed by the person making the same;" and the fifth rule states that "a station or stations shall he appointed at the entrance to the mine, or to different parts of the mine, as the case may require, and a workman shall not pass beyond any such station, until the mine or part of the mine beyond the station has been reported safe."

It will be seen that the Government does what it can to protect the lives of the working miners. It is not, of course, necessary to be so stringent in such mines as give off no inflammable gases, yet even in these proper supervision is required and enforced.

THE *Jekaterinoslav Nedelja* announces the discovery lately in the Uspenskij portion of the Ural range of some very rich auriferous deposits. On the first day twenty-two nuggets were found, four of which together weighed more than five Russian pounds. The remarkable feature in this discovery is not the quantity of gold forthcoming, but the singular form of the crystallization. Thus, one of the nuggets had among its gold crystals a pyramidal octahedron about one-fourth inch in size.

Animal Life In Mining Shafts.

Mr. S. P. Parks, Superintendent of a mine in Amador county, has sent down to the California Academy of Sciences a number of specimens of subterranean spiders. One vial contained small spiders; one containing a larger spider taken from a station where a dim lamp burns; one vial containing small gnats or wood lice, and a little brown worm. In the same vial were pieces of bark. There were also some pieces of wood from the timbers where these insects live, and pieces of the rock from the same places, all wrapped in paper in the mine when taken. The wood is covered with mold on the outside. The timbers are everywhere moldy. In some places the mold is evenly distributed on the timber, and from one to two inches thick. In others it hangs from the timbers like fringe and in long strips. In some places it is shaped like moss and toadstools. Webs are found in the shafts from the surface down (everywhere that there is not too much moisture) among timbers in all stages of decay; so are wood lice or gnats; but the worms only inhabit very rotten timber where there is some moisture.

As the adaptation of organic life to new surroundings, and the different methods in which this adaptation is accomplished, are of the highest interest to the biologist, and exhibit many points from which analogous of a more general character may be drawn, Dr. Herman Behr presented to the Academy a catalogue of the organisms received and mentioned above. He was assisted by W. G. W. Harford on the subject of mollusca, Dr. Eisen for the arachnides, and Dr. Harkness for the fungi.

The spiders were all of the same species, though of different sizes. The genus is related to the old genus *Theridon*, but is classified by the Swedish scientist Thorill, with a new genus. The same scientist has described the species which is peculiar to the American west coast. It weaves its nests in the crevices of the bark of trees, and has been found by Dr. Eisen in many localities of this coast, as far even as Guatemala, in Central America. The specimens came down alone from the mine. The exact name could not be given by Dr. Behr, because the Academy does not possess Thorill's works.

The worm which came from the shaft is a species of *Lethobius*, a genus related to the *Scolopendra* (centipede). It is found under the bark of trees.

The wood lice and gnats which were sent must escaped. Several pieces of wood were perforated in galleries, evidently the work of wood-feeding insect larvæ.

Besides the animals mentioned, were found the spider webs, five specimens of the common fly, and several specimens of a tiny snail, identified by W. Harford as *Hyalina arboriola*, a species found in the trees, as the name implies. Of fungoid growths, there were several kinds, only one of which was identified. Dr. Behr said:

It is more difficult to account for the presence of the house fly, and the the only explanation I can offer is that the specimens have been swept down by a current of air so strong that they could not resist. I am told that light objects at the entrance of shafts sometimes disapper rapidly, as if swallowed up by a kind of suction. How far into the depth such a current reaches I am unable to ascertain. At any rate, it is difficult to believe that winged insects like the house fly could propagate in such localities and raise new generations.

The animals introduced with the timber are either endowed with the faculty of adapting themselves to the new circumstances of an abode of eternal darkness or they are not.

It is next to certain that the origination of the Hyalina possesses all the conditions necessary to adapt itself for a subterranean existence. The animal under ordinary circumstances, seeks darkness and moisture, and is speedily killed when exposed for a certain time to the direct action of a powerful sun. It is a vegetarian, and finds plenty of nourishment on the fungoid growths, perhaps even on the wood itself.

Probably after a series of generations in darkness the eyes of the species will have disappeared entirely, as is the case with other animals digging underground or living in caves or in great depths of the ocean, inaccessible to light. Nature is economical and does not reproduce organs when there is no more use for them. As to the spiders, it is probable that they may continue through generations in their new abode, and even establish themselves permanently. They are exclusively carnivorous. They are not dependent entirely on the house-flies that are blown down the abyss, but probably not in all seasons. There is probably more animal life around them than the specimens at present demonstrate, or else a continued existence of the spider would be rather doubtful if it had to depend on such precarious supplies.

If they really continue to exist in their present abode they will lose their eyes, and will then exhibit the curious feature of an eyeless animal in a group that is classified by the number and position of the eyes.

The *Lithobius* is carnivorous like the spider, and has about the same chances to form a subterranean colony.

If the insects mentioned in the letter but not contained in the vial, are species of the winged insects, it is very improbable that they will form a permanent colony. The larva of many *tipulides* or of the *Psorus* have the light and are well adapted for subterranean existence, but a winged image living in absolute darkness has not yet been observed, and if at all, a permanent colonization of these species should establish itself, a great change in the organization of these animals must take place.

At any rate, we have in such shafts all the conditions necessary to support a little subterranean world of its own. We have rock and wood to support the fungus, wood and fungus to support the vegetation, and the vegetation to support the carnivorous.

THE Russian Minister of Marine has raised the question of employing petroleum fuel in the ships of the Black sea fleet, this material being considered cheaper than coal.

THE total annual reduction on the revenue on tobacco, snuff and cigars is now computed at $36,000,000.

Bromide of Sodium in Amalgamation.

A new method of amalgamation has been invented, the object of which is to assist the separation of gold from its ores by the use of bromide of sodium in the process of amalgamation. The ore is pulverized, roasted to remove sulphur, and finally chloridized in a suitable manner. The ore is then placed in amalgamating pans and mixed with bromide of sodium in the proportion of two pounds of bromide to a ton of the ore. To this is then added a sufficiency of water and of quicksilver to produce a proper amalgamation of the metal.

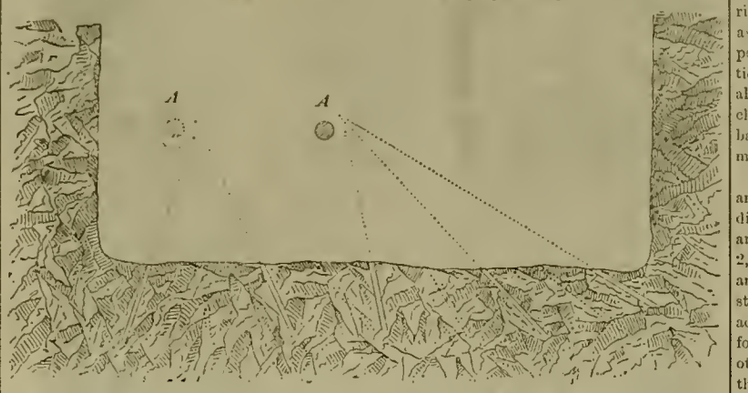


FIG. 1. POSITION OF CLAMP IN RADIAL SYSTEM OF BLASTING.

After the amalgamator has run about three hours the pulp is discharged through separators. By adding the bromide of sodium the sulphate and chloride are kept from attacking the mercury.

The inventor, W. E. Harris, of New York, is of course aware of the common use of cyanides of potassium, salt and sulphate of copper. The claim of the patent is as follows: "In attaining precious metals from ores by amalgamation, the process of protecting the mercury from the action of sulphate and chlorides, which consists in adding bromide of sodium to the ore in about the proportions stated, and then mixing the same with mercury and water."

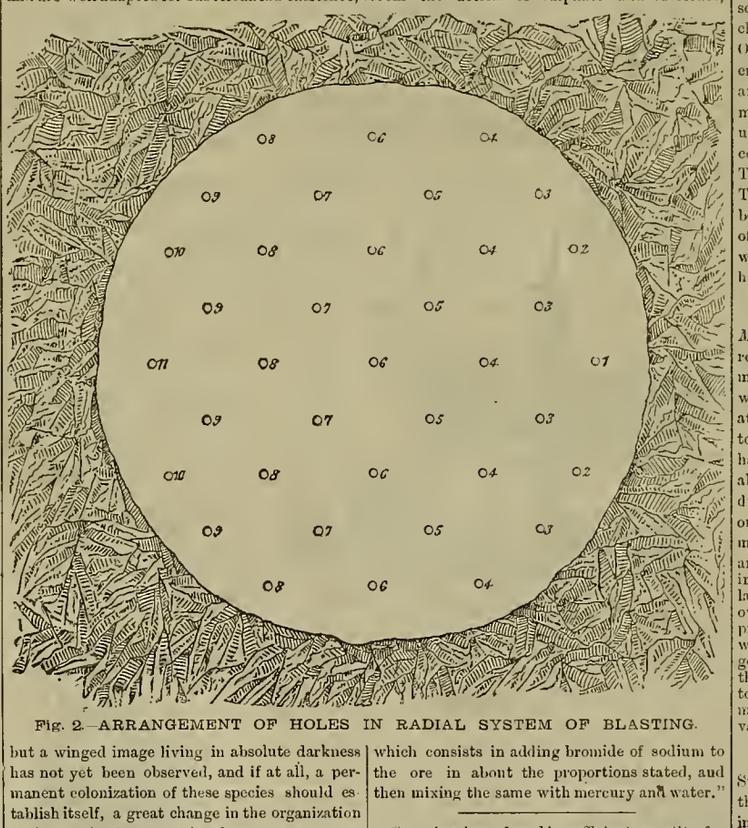


FIG. 2.—ARRANGEMENT OF HOLES IN RADIAL SYSTEM OF BLASTING.

GOLD has been found in sufficient quantity for exploration in twenty-three counties in the State of North Carolina, and occurs both in veins and gravel deposits extending over a wide area. At one time the yield of gold from North Carolina was very great, and afforded employment to a large number of hands, but the gold discoveries in this State diverted attention from North Carolina, and the subsequent disastrous civil war practically crippled all enterprise, and beggared what had previously been one of the wealthiest populations in the Union. From so rude a shock the recovery has naturally been both slow and tedious, but at length public attention is being again directed to the dormant wealth of the country.

Blasting in Mines—No. 7.

We have once before alluded to the "radial system" of drilling. This is a method of using the machine drill introduced by Mr. W. B. Brain, in which it is sought to fulfill the two sets of conditions, namely: those due to the exigencies of machine labor, and those involved in the attainment of the greatest useful effect from a given charge in the fullest possible degree. This method constitutes a system of both applying the drill and of placing the charges, and the success attending its adoption was marked. In this system the holes of each series, 1, 2, 3, 4, 5 (Fig. 2), or as many of them as possible, are made to radiate from some fixed point (Fig. 1), which point represents the position of the clamp on the stretcher bar. When all the holes in one series have been bored, the clamp is shifted a certain distance along the bar and the next series is bored in the same manner.

The distance apart of the holes of a series, and also of the series themselves, that is, in the distance between the series 1, 2, 3, and 1, 2,3, and also between the series 1, 1, 1, etc., and 2, 2, 2, etc., is determined beforehand, in accordance with the toughness of the rock and the strength of the explosive, and afterwards strictly adhered to, irrespective of joints, fissures due to former blasts, irregularities of the face, or any other circumstances that may exist peculiar to the case. The angles of the holes in a series, 1, 2, 3, etc., are also preserved through all of these series, so that all the holes in a series, 1, 1, 1, etc., are in the same place.

It will be observed that in this system the unkeying of the rock takes place from the side of the face by sharply angling the holes in that position, and that as many of the holes as possible are bored from one position of the stretcher bar. In general, unless the diameter of the excavation is very great, one change of position from *A* to *A'* will be sufficient. Thus it is evident that these charges have been reduced to the lowest limit in this system, and that, consequently, the loss of time due to the labor of charging has been brought to a maximum value. On the other hand, a certain loss of time is incurred in setting the machine to the required angle at each successive boring. It must be remarked that this system was designed for simultaneous firing with high explosives, and these conditions must be fulfilled to insure success. The cuts we take from "Andre's Coal Mining." The blasting, especially if the shot holes have been bored by machine drills, leaves the sides of the excavation in a very rough state. These will, therefore, require to be dressed down by hand with pick and wedge.

TO PROSPECTORS.—The Rocky Mountain *Mining Review* very truthfully as well as timely remarks, that there is very little money to be made in locating and doing the assessment work upon prospects with the view of selling at once. In the first place it is very difficult to sell an ordinary prospect—men with money have been bitten so often that they hesitate about taking a good thing and cannot be induced to touch an ordinary claim. In the second place, if a customer is found, the price must be so low that there is little money in it, and especially so where a second party is taken in for the purpose of procuring a sale. And lastly, where the claim has a real value, the owner is cheating himself in letting it go at a prospect price. The time was when a claim with a ten-foot hole would sell readily at a good price, regardless of its showing. But that time was long ago and we are now down to hardpan. The time has come, when to make a sale, there must be something of real value to transfer.

METAL FARMING.—The people of the Eastern States, says the Los Angeles *Herald*, who think that mining in California, and elsewhere in the United States, is a very capricious and profitless business, and that the true way to wealth lies in building cotton mills, catching codfish and raising potatoes and tobacco, are reminded of the fact which has been made up by laborious statistics running through thirty years, in the United States, from 1850 to 1880, that a large list of mines reported, shows that while $700,000,000 have been expended on mines of gold, silver and lead, these mines have returned $2,200,000,000; being only 300 per cent profit in cash.

The sum of $150,000 out of the $372,625 paid in dividends this month by mining companies, was paid by copper mines—Copper Queen, of Arizona, and Osceola, of Michigan.

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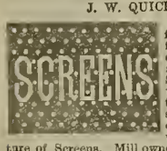
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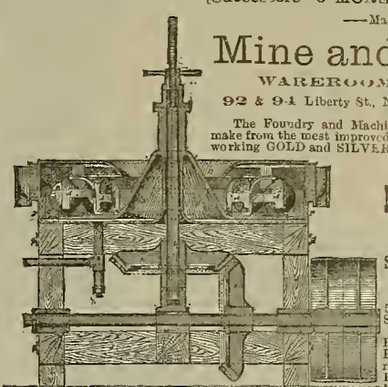
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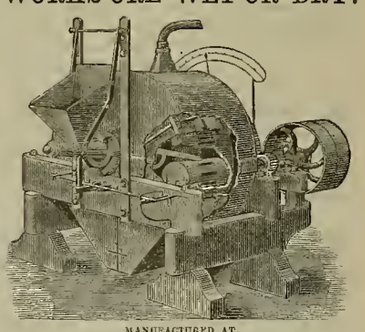
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DEPARTMENT NO 9—PROBATE. —IN THE Superior Court in and for the City and County of San Francisco, State of California. In the matter of the estate of ROSEMOND GREENWOOD, deceased.

Notice is hereby given, that Friday, the 28th day of September, A. D. 1883, at 10 o'clock, A. M. of said day, and the court-room of said Court, at the New City Hall, in the City and County of San Francisco, State of California, have been appointed as the time and place for proving the Will of said Rosemond Greenwood, deceased, and for hearing the application of George Spaulding and Mary Williams for the issuance to them of Letters Testamentary.

Dated, August 29th, A. D. 1883.

[SEAL.] WILLIAM T. SESNON, Clerk.
By E. J. CASEY, Deputy Clerk.
EDWARD W. BLANEY, Attorney for Petitioners.

BOUND VOLUME OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce, and valuable for future reference and library use.

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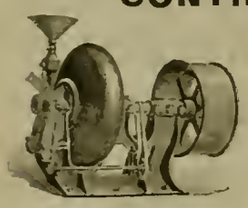
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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in Dewey & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING AUGUST 28, 1883.

283,632.—WATCH HOLDER—W. W. Blow, Oakland, Cal.

283,870.—PENCIL AND ERASER HOLDER—John Dooner, S. F.

283,968.—ROOF SCAFFOLDING—A. R. Manley, San Jose.

283,969.—FLOUR BIN AND SIFTER—A. R. Manley, San Jose.

284,038.—SAWING MACHINE—George McCoy, New Tungeness, W. T.

284,051.—EGG BEATER—W. P. & W. B. O'Brien, Jr., Santa Clara.

284,134.—STEAM BOILER FOR TRACTION ENGINES—L. F. Lillard, Dixon, Cal.

284,067.—DIAMOND DRILL SAFETY MACHINE—Ross & Grant, Virginia, Nev.

283,930.—RETORT CRATE—Smith & Morton, S. F.

283,836.—LASTING—W. H. Snyder, S. F.

283,937.—DUMPING WAGON—George M. Wallace, Yuba City, Cal.

283,941.—WINDOW BLIND—Jos. Williams, San Jose.

284,132.—METALLIC RAILWAY TIE—J. W. Young, Fort Maginnis, A. T.

NOTE.—Copies of U. S. and Foreign Patents furnished by Dewey & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

WATCH HOLDER.—Walter H. Blow, Oakland, Alameda Co. No. 283,855. Dated August 28th, 1883. This is a device by which an open watch may be conveniently supported with its face in an upright position so as to be easily read whenever desired, and which device may also support a suitably sized watch-safe, photograph holder or jewel case. The back piece is made of wood, metal or any suitable material, slightly curved to receive the watch. A curved bent wire has its ends bent to one side so that they may be received in the face of the back piece. The watch slips in behind the curved wire which arches around in front of its upper periphery. The device may be hung or fixed permanently in any convenient position on a wall or on the head of a bed, or it may be shaped so as to rest on a table or stand with a supporting brace behind.

DUMP WAGON.—Geo. M. Wallace, Yuba City, Sutter Co., Cal. No. 283,937. Dated Aug. 28, 1883. This dump wagon has a peculiar hinged bottom, so the load is easily discharged. When in a horizontal position the boards lie close together and retain the load, but when thrown down on their edges in a vertical or inclined position they are so separated or opened that the load of dirt or other material will fall through. By decreasing the number of boards and measuring the width of spaces, rock may be dumped with as much facility as dirt. There are inclined ends or gates which give great capacity to the body, and also furnish a protection or cover for the oscillating shafts.

ROOF SCAFFOLDING.—Aaron R. Manley, San Jose, No. 283,968. Dated Aug. 28, 1883. This invention is a device which Mr. Manley calls roof scaffolding, and it consists of plates to which boards for a scaffolding may be fixed, and to one end of which is hinged an adjustable brace, while to the other end is hinged a bar or plate, which lies along the inclined roof, and has a gorge-bar fixed to it, this inclined bar and the brace serving to level the one which supports the staging, and adjust it to a roof of any pitch. The staging can be easily placed or moved from point to point with but little delay or loss of time, and no damage to the roof. It is firm and secure when in place.

BLACKBOARD RUBBER.—John Dooner, S. F. No. 283,870. Dated Aug. 28th, 1883. This is an improved rubber or eraser for blackboards. There is a main frame or body, and a secondary frame fitted within the main portion, and adapted to receive the erasing material around its periphery and below the main portion, which is combined with hooking devices by which the two frames may be secured together.

FLOUR BIN AND SIFTER.—Aaron R. Manley, San Jose. No. 283,969. Dated Aug. 28, 1883. The flour chamber holds one or more sacks of flour, which are emptied into it and covered up to keep out dust and insects. When flour is required, by turning a crank at the top a shaft and sieve are rotated, which causes the flour to pass through into a bin, or any suitable receptacle, being sifted on its way.

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INFORMATION is wanted at this office of one Joseph Craig formerly of Cass county Illinois who came to California in 1849.

Improved Quartz Mill Work.

Written for the PRESS by ALEX. H. EWART.

Knowing the interest your paper has always taken in the economical development of the mineral interest of the country, I have thought a description of a new quartz mill might prove interesting. This mill, after a successful run of over six months, has fully established the claim made by its builders, of great superiority over mills of its class. I refer to the mill of Total Wreck M. & M. Co., of Total Wreck, Pima county, Arizona.

The mill, constructed under the management of N. R. Vail, Esq., agent of the company (a New York incorporation), was erected under contract by Wm. H. Armstrong Hinckley, Spear & Co., of this city furnishing the machinery.

It is a twenty-stamp mill, driven by a Corliss engine, 20" diameter, 48" stroke; the main belt is run directly from the fly wheel which is 18 feet in diameter. The mill is furnished with rock breaker, twenty stamps, fourteen pans heated by exhaust steam, in addition to the clean-up pan and steam pump for returning the quicksilver to the pans.

The tramway that conveys the ore from the mine to the mill is sufficiently elevated to allow the ore bin to be placed above the rock-breaker, thus allowing all ore small enough for the battery to pass directly through the "grizzly," while all too large for that passes directly to the rock-breaker and is reduced for the stamps.

One great advantage of the continuous process to be spoken of hereafter is this, that from the time the ore is dumped from the car till it leaves the mill in the form of tailings, it requires no handling. Gravity, and a flow of water regulated to the requirement, takes the place of much handling and disagreeable work by the old process known as the tank process. The determination of the builder to reduce the amount of manual labor to the lowest point has been most successfully carried out, until it may be said, in fact, that nearly all the work is done by steam power, and the only labor required is in keeping the machinery in good order.

To demonstrate this, I will give some details of the labor employed and wood consumed, which taken in connection with the amount of ore worked, the high percentage obtained and thesm all loss of quicksilver per ton of ore milled, will effectually establish the claim of its builder, as also show the superiority of the continuous process of Mr. Boss, the inventor, whose patient labor and careful manipulation must have greatly aided Mr. Armstrong the superintendent as well as builder of the mill in bringing about the favorable results here recorded.

Careful trials were made for some weeks when the mill was first started by running half the stamps and half the pans under each style of working, and thus a comparative test of great value was obtained, the ore and tailings from each process being assayed daily, and the result showed a very decided gain in the percentage by the Boss continuous process, as compared with the old method, as follows:

Tank.	Continuous.
84 12-100 per cent.	86 25-100 per cent.

The loss of quicksilver, though evidently less on the continuous side, could not at that time be determined, as compared with the tank method, as the total loss only could be ascertained. The last months, however, showed a very material reduction in the loss of quicksilver, although the average from the first starting was but 1 10-100 pounds per ton, and this in an ore containing quite a percentage of lead and manganese. The mill with ease handles seventy tons of ore in twenty-four hours, burning only four and one-half cords of wood in that time, and dispensing with not less than eight men employed as tank men by the old method.

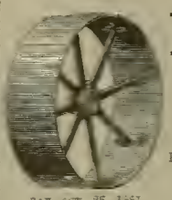
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Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, or lending their influence and encouraging favors. We intend to send none but worthy men.

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Mining Books.

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News in Brief.

A SHEEP herder in Lassen county recently caught a grizzly bear in a trap. He weighed, when dressed, 800 pounds.

THE epizooty is prevalent among the horses in Contra Costa county, and some valuable animals have died from the effects of it.

THE government of Batavia voted £5,000, and the government of Java £1,000, for the relief of sufferers by the volcanic eruptions.

IT is thought the conduit system with telephone and telegraph lines, will quickly supersede the pole-stringing method now in vogue.

THE University of Chautauqua has permanently organized, not a cooking school, but a cooking college, which will probably prove a benefit on a large scale.

THE drought for the past two months has greatly damaged the crops throughout the south side of Virginia. In some sections there will be not more than half a crop of corn, cotton and tobacco. The streams are fast drying up.

THE Navy Department is in receipt of a letter stating that the body of a man supposed to be that of Master Putnam, of the Rogers, was found at Cape Prince of Wales, Alaska, by natives, when the ice broke up in August, 1882.

TWO THOUSAND peasants invaded Krapina, Russia, Saturday, for the purpose of attacking the Jews in that place. The mob was fired upon by the military and one man was killed and three wounded. Fourteen peasants were arrested.

A GOOD AND SERVICEABLE ELEVATOR.—Messrs. Philip Hinkle & Co., whose works are located at Nos. 116 and 118 Main street, S. F., are the pioneers in building and inventing elevators on the Pacific coast. They manufacture all kinds of patent hydraulic, air pressure, steam and hand power elevators, with the latest improved appliances. The Hinkle hydraulic elevator is the most popular in the Pacific States, as it is largely used on this coast, having many merits that other makes do not possess. Among the many that are used in buildings in San Francisco may be mentioned Hallock block, Nevada block, Mechanics' Institute, Union block, Murphy, Grant & Co., Oriental block, besides many other costly and prominent buildings and business blocks. Contractors and owners having in view the construction of elevators in their buildings should consult Philip Hinkle & Co. for estimates before deciding. The individual members of the firm are Philip Hinkle and A. J. McNicoll.

AN OLD ELECTRIC LIGHT PATENT.—The first attempt to manufacture electric incandescent lamps has been ascribed to M. de Chagny, whose operations were said to have been conducted some twenty years ago. The credit of the invention and its practical application, however, are now claimed for a young American, Mr. Starr, whose patent was taken out in 1845.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

Seaton Gold Mining Company.—Location

of principal place of business, San Francisco, California. Location of works, Dry Town, Amador county, California.

NOTICE.—There are delinquent upon the following described stock, on account of Assessment No. 3, levied July 31, 1883, the several amounts set opposite the name of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Martin, A, Trustee	6	5,000	$400 00
Martin, A, Trustee	7	5,000	400 00
Martin, A, Trustee	8	5,000	100 00
Martin, A, Trustee	9	5,000	400 00
Martin, A, Trustee	10	1,000	80 00
Martin, A, Trustee	11	1,000	80 00
Martin, A, Trustee	12	1,000	80 00
Martin, A, Trustee	13	1,000	80 00
Martin, A, Trustee	14	1,000	80 00
Martin, A, Trustee	15	1,000	80 00
Martin, A, Trustee	16	1,000	80 00
Martin, A, Trustee	17	1,000	80 00
Martin, A, Trustee	18	1,000	80 00
Martin, A, Trustee	19	1,000	80 00
Martin, A, Trustee	20	500	40 00
Martin, A, Trustee	21	500	40 00
Martin, A, Trustee	22	500	40 00
Martin, A, Trustee	23	500	40 00
Martin, A, Trustee	24	500	40 00
Martin, A, Trustee	25	500	40 00
Martin, A, Trustee	26	500	40 00
Martin, A, Trustee	27	500	40 00
Martin, A, Trustee	28	500	40 00
Martin, A, Trustee	29	500	40 00
Martin, A, Trustee	30	1,000	320 00
Martin, A, Trustee	31	900	72 00
Martin, A, Trustee	33	5,000	400 00
Martin, A, Trustee	34	5,000	400 00
Martin, A, Trustee	35	5,000	400 00
Martin, A, Trustee	36	4,900	392 00
Martin, A, Trustee	38	5,000	400 00
Martin, A, Trustee	39	5,000	400 00
Martin, A, Trustee	40	5,000	400 00
Martin, A, Trustee	41	5,000	400 00
Martin, A, Trustee	42	5,000	400 00
Martin, A, Trustee	43	10,000	800 00

And in accordance with law and an order of the Board of Directors, made on the 31st day of July, 1883, so many shares of each parcel of said stock as may be necessary will be sold at public auction, at 528 California St., Room 6, San Francisco, Cal., on THURSDAY, the 27th day of September, 1883, at the hour of 1 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

A. MARTIN, Secretary.

OFFICE—Room 6, 528 California St., San Francisco, California.

September 5, 1883.

New Life

is given by using BROWN'S IRON BITTERS. In the Winter it strengthens and warms the system; in the Spring it enriches the blood and conquers disease; in the Summer it gives tone to the nerves and digestive organs; in the Fall it enables the system to stand the shock of sudden changes.

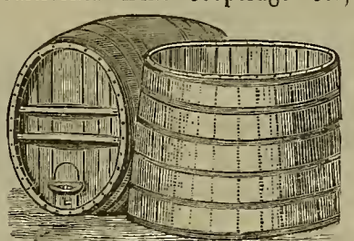
In no way can disease be so surely prevented as by keeping the system in perfect condition. BROWN'S IRON BITTERS ensures perfect health through the changing seasons, it disarms the danger from impure water and miasmatic air, and it prevents Consumption, Kidney and Liver Disease, &c.

H. S. Berlin, Esq., of the well-known firm of H. S. Berlin & Co., Attorneys, Le Droit Building, Washington, D. C., writes, Dec. 5th, 1881:

> *Gentlemen:* I take pleasure in stating that I have used Brown's Iron Bitters for malaria and nervous troubles, caused by overwork, with excellent results.

Beware of imitations. Ask for BROWN'S IRON BITTERS, and *insist* on having it. Don't be imposed on with something recommended as "*just as good.*" The genuine is made only by the Brown Chemical Co. Baltimore, Md.

California Wine Cooperage Co.,



FULDA BROS., Proprietors,

30 to 40 Spear St., - San Francisco.

ALL KINDS OF CASKS, TANKS, ETC.

☞ SHIP, MINING, and WATER TANKS a Specialty. ☜

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company.

San Francisco, September 1, 1883.

At a meeting of the Board of Directors of the above named company held this day, Dividend No. 58, of twenty-five cents (25c.) per share, was declared, payable WEDNESDAY, September 12, 1883, at the Farmers' Loan and Trust Company, in New York, or at the office in this city.

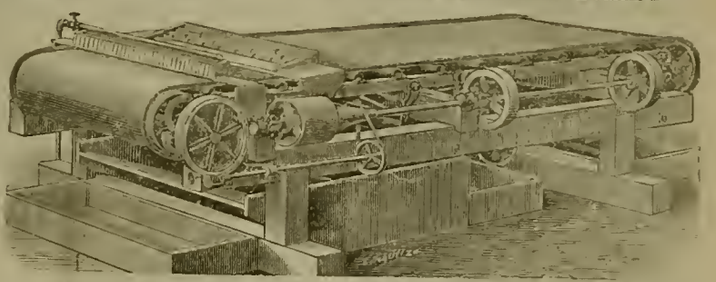
WILLIAM WILLIS, Secretary.

OFFICE—Room No. 29, Nevada block, No. 309 Montgomery street, San Francisco, Cal.

Cheap Ore Pulverizer.

There is for sale in this city, by I. A. Heald, American Machine and Model Works, 111 and 113 First St., a Ratherford Pulverizer, an improved revolving barrel crusher, which was only used a few times and is as good as new. It will be sold very much below cost, and miners who are in need of such an appliance for a small mine will do well to make inquiries concerning it. It is suitable for a pulverizing mill for powder or other substances. Reference as to above can be had upon applying to this office.

$1,000 CHALLENGE!



THE FRUE ORE CONCENTRATOR,

—OR—

VANNING MACHINE.

Over 400 are now in use, giving entire satisfaction. Saves from 40 to 100 per cent. more than any other Concentrator in use, and concentrations are clean from the first working. The wear and tear are merely nominal.

A machine can be seen in working order, and ready to make tests, at the office of Hinckley, Spiers & Hayes, 220 Fremont Street.

To those intending to manufacture or purchase the so-called "Triumph" Concentrator, we herewith state:

That legal advice has been given that *all shaking motion* applied to an *endless traveling* belt used for concentration of ores is an infringement on patents held and owned by the Frue Vanning Machine Company.

That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.

That the patent laws make *users* of infringements responsible as well as makers, and the public is therefore warned that there is considerable risk in purchasing any end-shake machine until our various patents have been decided.

That if there are those who for any reason prefer an end-shake machine, we can manufacture and sell to such machine of that description, as efficient as the Triumph, and at a lower price, and no liability for infringement will then be incurred by the purchaser.

That we shall protect ourselves against any one making, selling or using any machine infringing any of our patents. Patented July 9, 1867; May 4, 1869; Dec. 22, 1874; Sept. 2, 1879; April 27, 1880. Patents applied for.

That we are, and have been, ready at any time, to make a competitive trial against the Triumph, or any other machine, for stakes of $1,000.

ADAMS & CARTER, Agents Frue Vanning Machine Company,

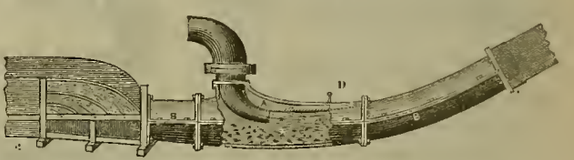
Room 7. 109 California Street, - - - - SAN FRANCISCO, CAL

Nov. 6, 1882.

HYDRAULIC GRAVEL ELEVATORS.

The Great Problem of Shallow Hydraulic Mining Solved.

NEW FIELDS OF ENTERPRISE IN HYDRAULIC MINING OPENED UP.



These machines are thoroughly effective for working flat gravel mines that have no dump.

Sluices gravel and water up hill on an angle of 45°, and will run any kind of gravel that will run in a flume. Handles rocks as easy as fine dirt, and will raise as much material as the water will carry off in a flume on 6 inches grade to 12 feet.

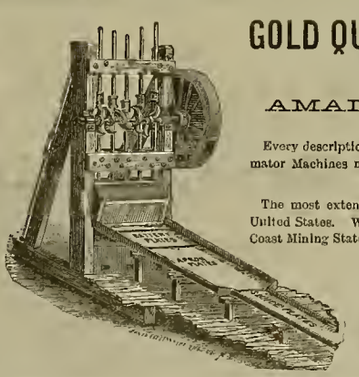
No bedrock cuts, tunnels or drains required. Machine a sufficient drain itself, and the process of mining the same as any other hydraulic mine. Is now a practical success in various places in California and Oregon.

At the property of the Yreka Creek Gold Mining Company, in Siskiyou county, Cal., an Elevator of the Improved Form has been introduced, which, with a head or pressure of water of 266 feet, is elevating through an 18-inch machine to a vertical hight of 46 feet from bedrock to upper flume.

☞ Descriptive Catalogues and prices furnished on application to the undersigned, who are the sole manufacturers of these machines.

JOSHUA HENDY MACHINE WORKS,

49 and 51 Fremont St., - - - - San Francisco, Cal.



GOLD QUARTZ and PLACER MINERS'

Silver Plated

AMALGAMATING PLATES,

For Saving Gold.

Every description of plates for Quartz Mills and Wet or Dry Placer Amalgamator Machines made to order, corrugated or plain.

OVER 2,000 ORDERS FILLED.

The most extensive and successful manufacturer of these plates in the United States. Will fill orders for delivery in Rocky Mountain and Pacific Coast Mining States at lower prices than any other manufacturer.

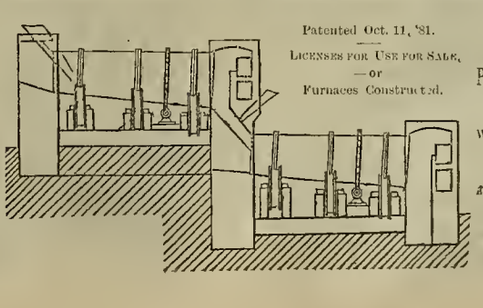
Old Mining Plates Replated. Old Plates bought, or gold separated for low percentage of result.

SEND FOR PRICE LIST.

SAN FRANCISCO PLATING WORKS,

653 & 655 Mission St., San Francisco, Cal.

E. G. DENNISTON, Proprietor.



Patented Oct. 11, '81.

LICENSES FOR USE FOR SALE, —or— Furnaces Constructed.

NEVIN'S

CELEBRATED

Patent Ore Roasting and Chloridizing

FURNACE,

Working up to 94 per cent of Fire Assay, using 25 per cent less salt since July, 1882.

☞ LICENSES FOR USE FOR SALE, ☜

Or Furnaces Constructed.

Address,

R. A. NEVIN, Patentee,

(Box 2361.) San Francisco, Cal

Iron and Machine Works.

UNION IRON WORKS,
SACRAMENTO, CAL.
ROOT, NIELSON & CO.,
MANUFACTURERS OF
STEAM ENGINES, BOILERS AND ALL
Kinds of Machinery for Mining Purposes.
Flouring Mills, Saw Mills and Quartz Mills Machinery constructed, fitted up and repaired.
Front Street, Between N and O Streets,
SACRAMENTO, CAL.

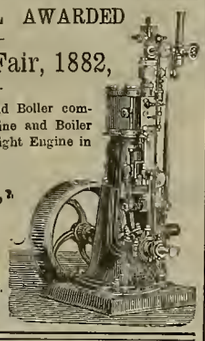
Golden State & Miners Iron Works,
Manufacture Iron Castings and Machinery of all Kinds at Greatly Reduced Rates.
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Mold-Board AMALGAMATORS,
Golden State Pressure Blowers.
First St., between Howard & Folsom, S. F.

California Brass Foundry,
No. 125 First Street, Opposite Minna.
SAN FRANCISCO, CAL.
All kinds of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, Sheathing Nails, Rudder Brace, Hinges, Ship and Steamboat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch. PRICES MODERATE.
J. H. WEED. V. KINGWELL.

California Machine Works,
WM. H. BIRCH,
Engineer and Machinist,
119 Beale Street, San Francisco.
Portable and Double Sawmills, Steam Engines, Flour, Quartz and Mining Machinery. Brodie's Patent Rock Crusher
PRICES GREATLY REDUCED.
No. 1 Crusher, 4 tons per hour.....$450.00
" 2 " 6 " " " 625.00
" 3 " 8 " " " 925.00
" 0 " 1500 lbs " " 150.00
The Best Crusher in the Market and at the Lowest Prices. Power, Hydraulic Ram or Cylinder Elevators, Hand Power Hoists, for sidewalks any purpose, Saw Arbors and Mill Fittings. Repairing promptly attended to

THOMAS THOMPSON. THORNTON THOMPSON.
THOMPSON BROTHERS,
EUREKA FOUNDRY,
and 131 Beale St., between Mission and Howard, S. F.
MANUFACTURERS OF CASTINGS OF EVERY DESCRIPTION.

SILVER MEDAL AWARDED
—AT—
Mechanics' Fair, 1882,
—FOR—
Best Upright Engine and Boiler combined, Best Hoisting Engine and Boiler combined and Best Upright Engine in motion to
W. H. OHMEN,
Machine and Engine Works,
109 & 111 Beale St.
SAN FRANCISCO.



"CLAYTON" IMPROVED
ROCK DRILLS. MINING PUMPS.

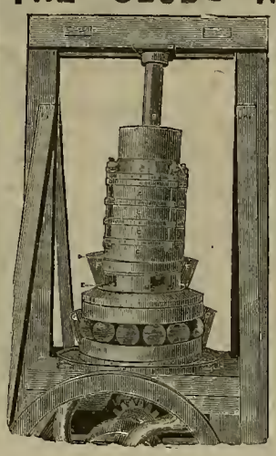

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For CATALOGUES, ESTIMATES, Etc Address
CLAYTON STEAM PUMP WORKS
45 & 47 York St. BROOKLYN, N.Y.
(Near Approach to New York & Brooklyn Bridge)

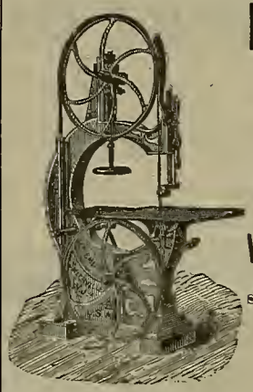
Only "PEBBLE" Establishment.
1863  1883
Muller's Optical Depot,
185 Montgomery St. near Bush.
SPECIALTY FOR 33 YEARS.

The most complicated cases of defective vision thoroughly diagnosed, free of charge. Orders by mail or express promptly attended to.
Compound Astigmatic Lenses Mounted to Order. Two Hours Notice.

COKE. PATENT. COKE.

This COKE is exclusively used by Prof. Thomas Price, in his assay office, by the Selby Smelting and Lead Co., Prescott, Scott & Co., Risdon Iron and Locomotive Works and others in this city. Large supplies are regularly forwarded to consumers in Salt Lake and Nevada, to the Copper Queen Mining Co., Longfellow Copper Mining Co. and other consumers in Arizona.
The undersigned are in receipt of regular supplies from Cardiff, Wales, and offer the COKE for sale in quantities to suit purchasers.
BALFOUR, GUTHRIE & CO.,
316 California St., San Francisco.

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THE GLOBE IRON WORKS COMPANY.

Dyer Cannon Ball Quartz Mill.
Manufacturers and Repairers of all Kinds of
Machinery and Iron Castings,
—AND BUILDERS OF—
LOCOMOTIVES, HOISTING and MINING MACHINERY,
Portable, Stationary and Marine Engines,
—MANUFACTURERS OF THE—
DYER CANNON BALL QUARTZ MILL.
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PARKE & LACY, Proprietors.

No. 8 California Street,
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Importers and Dealers in every Variety of

GARDNER GOVERNOR.
Wood and Iron Working Machinery,
STEAM PUMPS,
Stationary, Portable and Hoisting Engines and Boilers Sawmills, Shingle Mills, Emery Wheels and Grinders, Gardner Governors, Planer Knives, Sand Paper in Rolls, together with a general line of Mining and Mill Supplies, including Leather Belting, Rubber Belting Packing and Hose.
Catalogues furnished on Application.

William Hawkins.
(SUCCESSOR TO HAWKINS & CANTRELL).
MACHINE WORKS
210 and 212 Beale Street, bet. Howard and Folsom Sts., - - San Francisco.
Manufacturer of
IMPROVED PORTABLE HOISTING ENGINES,
FOR MINING AND OTHER PURPOSES.
Also of the HAWKINS' PATENT ELEVATOR HOIST, for Hotels, Warehouses and Public Buildings.
Steam Engines and all Kinds of Mill and Mining Machinery.

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National Iron Works,
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MANUFACTURERS OF
IMPROVED PORTABLE HOISTING ENGINES
At Greatly Reduced Prices.
HOME INDUSTRY! ALL WORK TESTED AND GUARANTEED!
Stationary and Compound Engines, Flour, Sugar, Quartz and Saw Mills. Amalgamating Machines.
CASTINGS AND FORGINGS OF EVERY DESCRIPTION.
Sole Manufacturers of Kendall's Patent Quartz Mills.

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MANUFACTURERS OF
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Car and Locomotive Axles and Frames, and Hammered Iron of Every Description.
HIGHEST PRICE PAID FOR SCRAP IRON
Orders Solicited and Promptly Executed.
Office, No. 202 Market St., UNION BLOCK.

THE RISDON IRON AND Locomotive Works
Corner Beale and Howard Sts.,
SAN FRANCISCO, CAL.
W. H TAYLOR, Pres't. JOSEPH MOORE, Sup't
Builders of Steam Machinery
IN ALL ITS BRANCHES,
Steamboat, Steamship, Land
Engines and Boilers,
HIGH PRESSURE OR COMPOUND.
STEAM VESSELS, of all kinds, built complete with Hulls of Wood, Iron or Composite.
ORDINARY ENGINES compounded when advisable.
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STEAM BOILERS. Particular attention given to the quality of the material and workmanship, and none but first-class work produced.
SUGAR MILLS AND SUGAR-MAKING MACHINERY made after the most approved plans Also, all Boiler Iron Work connected therewith.
WATER PIPE, of Boiler or Sheet Iron, of any size made in suitable lengths for connecting together, or sheets rolled, punched, and packed for shipment ready to be riveted on the ground.
HYDRAULIC RIVETING. Boiler Work and Water Pipe made by this establishment, riveted by Hydraulic Riveting Machinery, that quality of work being far superior to hand work.
SHIP WORK. Ship and Steam Capstans, Steam Winches, Air and Circulating Pumps, made after the most approved plans.
PUMPS. Direct Acting Pumps, for Irrigating or City Water Works purposes, built with the celebrated Davy Valve Motion, superior to any other Pump.

WATER JACKET SMELTING FURNACES
—FOR—
Galena Silver & Copper Ores.
The PACIFIC WATER JACKET SMELTERS embrace many features that are entirely new and of great practical utility, which are covered by letters patent.
No other furnaces can compare with these for durability and in capacity for uninterrupted work.
MORE THAN ONE HUNDRED of them are now running on the Pacific Coast, giving results never before obtained as regards continuous running, economy of fuel, grade and quality of bullion produced. We are prepared to demonstrate by facts the claims here made.
These Smelters are shipped in a complete state, requiring no brick or stone work, except that for the crucible, thus saving great expense and loss of time in construction.
Complete smelting plants made to order of any capacity and with all the improvements that experience has suggested as valuable in this class of machinery. Skilled and experienced smelters furnished when desired to superintend construction and running of furnaces. Estimates given upon application. Send for circular.
RANKIN, BRAYTON & CO.
Pacific Iron Works, San Francisco, Chicago and New York.

Patent Life-Saving Respirator.
PREVENTS LEAD POISONING AND SALIVATION.

Invaluable to those engaged in dry crushing quartz mills, quicksilver mines, white lead corroding, feeding thrashing machines and all occupations where the surrounding atmosphere is filled with dust, obnoxious smells or poisonous vapors. The Respirators are sold subject to approval after trial, and, if not satisfactory, the price will be refunded. Price, $3 each, or $30 per dozen
Address all communications and orders to
H. H. BROMLEY, Sole Agent,
43 Sacramento Street, San Francisco, Cal.

MINES WANTED.
Two California Quartz Gold Mines for customers. Must be sufficiently developed to show value, and submitted with reports and 90-day bond.
MARS & LAWVER,
45 Merchants' Exchange, San Francisco.
REFERENCES—J. B. Haggin, Louis A. Garnett, John J. Valentine, Anglo-Californian and Donohoe, Kelly & Co.'s Banks.

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18 and 20 Fremont Street, - - - - - - San Francisco, Cal.

IRON AND STEEL WIRE HOISTING ROPES.



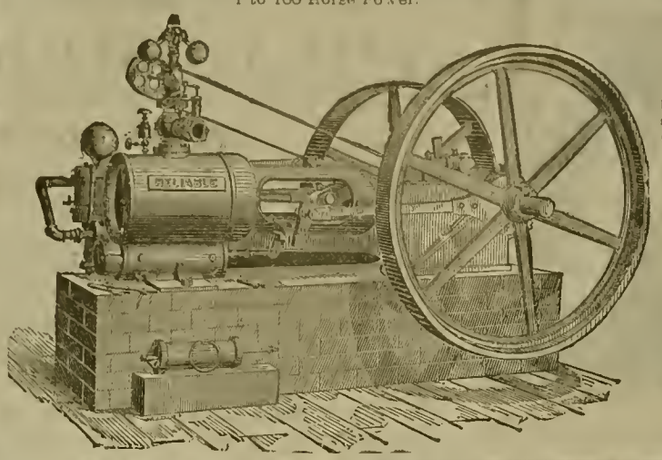
ORE CARS.

WIRE ROPE
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ORE AND Water Buckets. BELT Compressors.



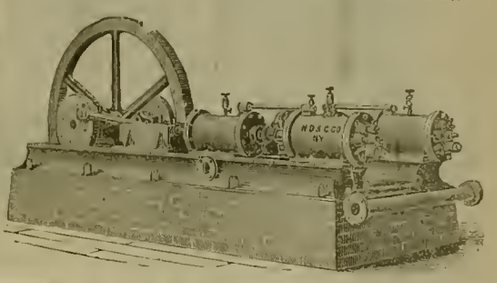
HORIZONTAL AND VERTICAL ENGINES
1 to 100 Horse Power.



MINERS' HORSE-WHIM

One Horse can easily hoist over 1,000 pounds at a depth of 500 feet. The whim mainly built of wrought iron. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending the bucket. The standard of the whim is bolted to bed-timbers, thus avoiding all iron work. When required these whims are made in sections to pack on mules.

NATIONAL DUPLEX COMPRESSOR.



KNIGHTS' Mining Water Wheel.
OVER 200 IN USE IN CAL.



PACIFIC MACHINERY DEPOT.

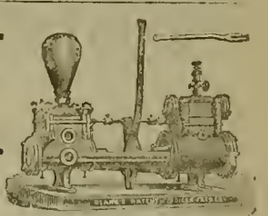


The Korting's Injector is the simplest, cheapest and best in use. Will draft its own water, hot or cold, and feed under varying pressure. Send for Circular.

H. P. GREGORY & CO.,

Importers and Dealers in Machinery and Supplies.

Nos. 2 and 4 California Street, S. F.

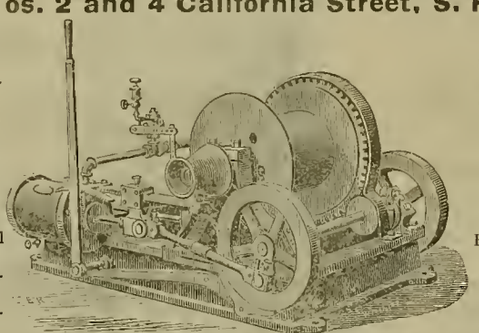


BLAKE STEAM PUMP.
More Than 16,000 in Use.

SOLE AGENTS FOR

- J. A. Fay & Co., Wood Working Machinery.
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- Blake's Steam Pumps.
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- Payne's Vertical and Horizontal Steam Engines.
- Williamson Bros. Hoisting Engines.
- New Haven Machine Co.'s Machinists' Tools.
- Otto Silent Gas Engines.





Hoisting Engines of all Kinds.

SOLE AGENTS FOR

- Sturtevant's Blowers and Exhausts.
- Judson's Steam Governors.
- Pickering's Steam Governors.
- Tanite Co. Emery Wheels.
- Nathan & Dreyfus' Oilers.
- Korting's Injectors and Ejectors.
- Disston's Circular Saws.
- Frank & Co.'s Wood Working Machinery.
- New York Belting & Packing Co.'s Rubber Belting, Hose, Packing, etc.
- Ballard's Oak Tanned Leather Belting.



MINING MACHINERY

INCLUDING

Steel Water Jacket Smelting Furnace,

Quartz Mills, Concentration Works, Hoisting Apparatus, and all classes of Machinery employed in Mining and Reduction of Ores.

PORTABLE AND STATIONARY

STEAM ENGINES

From Ten to Two Hundred Horse Power. Steam Boilers of any Style and Capacity.

SAW MILLS

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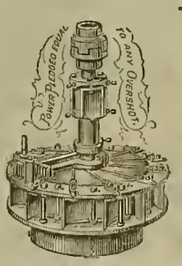
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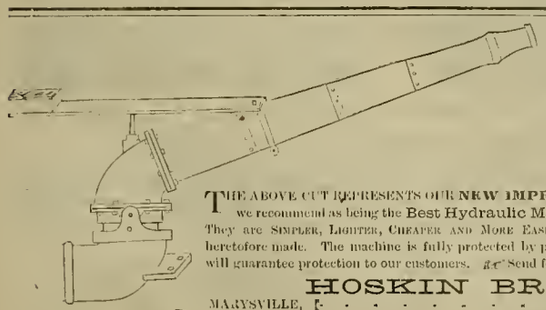
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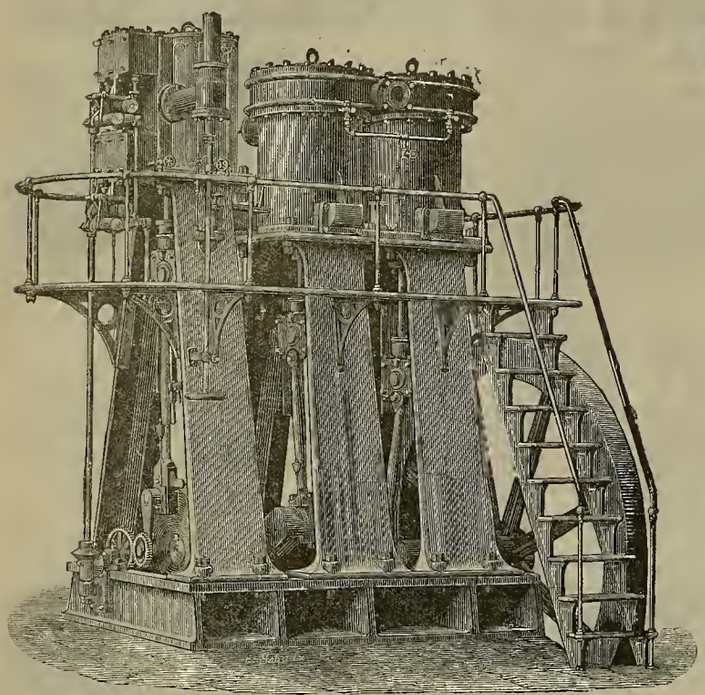
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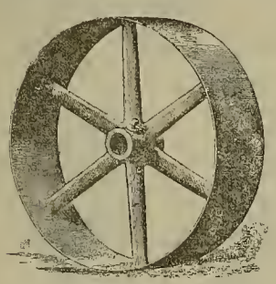
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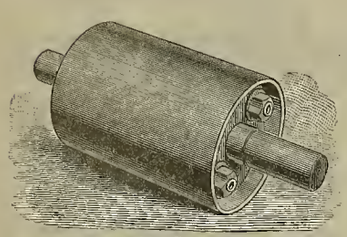
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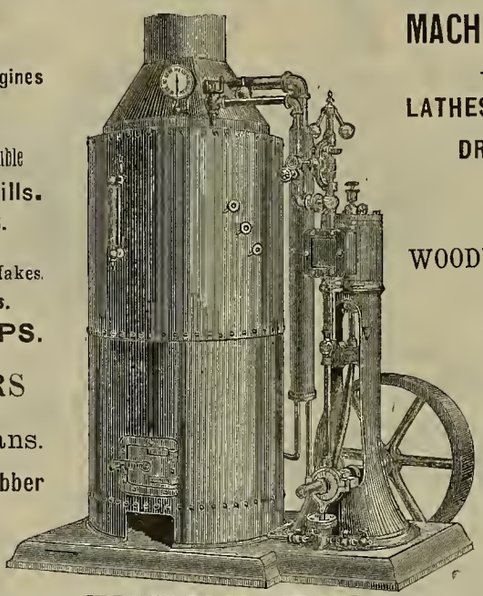
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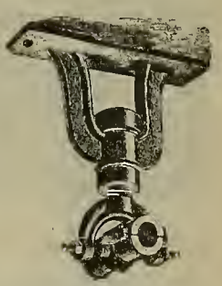
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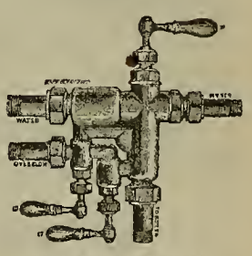
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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, SEPTEMBER 15, 1883.

VOLUME XLVII
Number 11.

A New Ore Stamp.

The engraving on this page represents a new form of ore stamp, patented not long since through the MINING AND SCIENTIFIC PRESS Patent Agency by James McFarland, of Carson, Nev. In the ordinary form of stamp battery, a difficulty is found in that, when the cam is revolved above a certain rate of speed, it makes its revolution and catches the tappet before the stamp has had time to strike the die. The object of Mr. McFarland's invention is to overcome this difficulty by providing a means for speeding the stamp so that it will be impossible for the cam to reach the tappet before the stamp has reached its limit of descent.

Extending from the ordinary frame is a bracket or projection in which are the journals for a rock shaft or cross shaft, on which are two diverging arms. One of these arms is curved downward and forward to the tappet, on the top of which its end rests. The end is turned up to avoid interference with the tappet. The other arm extends back and downward, and somewhat in the shape of an imperfect letter S. These two arms are joined together on one hub on the shaft.

The operation of the device is as follows: When the cam raises the tappet the forward arm is raised with it, and the rear arm is drawn inwardly, its lower curve fitting against the back of the cam at the moment the cam relieves the tappet. In its continued movement the cam must force this rear arm outward or backward again, by doing which the forward arm is forced down upon the top of the tappet and accelerates the drop or fall of the stamp. By this construction the stamp must deliver its blow, because the cam cannot free itself from the rear arm until it has forced it back completely, in which position the forward arm must have forced the stamp to its limit of downward throw. From the first impingement of the cam against the rear arm to the end of its contact therewith, the speed with which it is forced out increases, and the descent of the upper or forward arm is consequently increased, thus exerting its force upon the tappet to the very moment of striking the ore in the mortar, or nearly so, according to the height of the ore in the mortar.

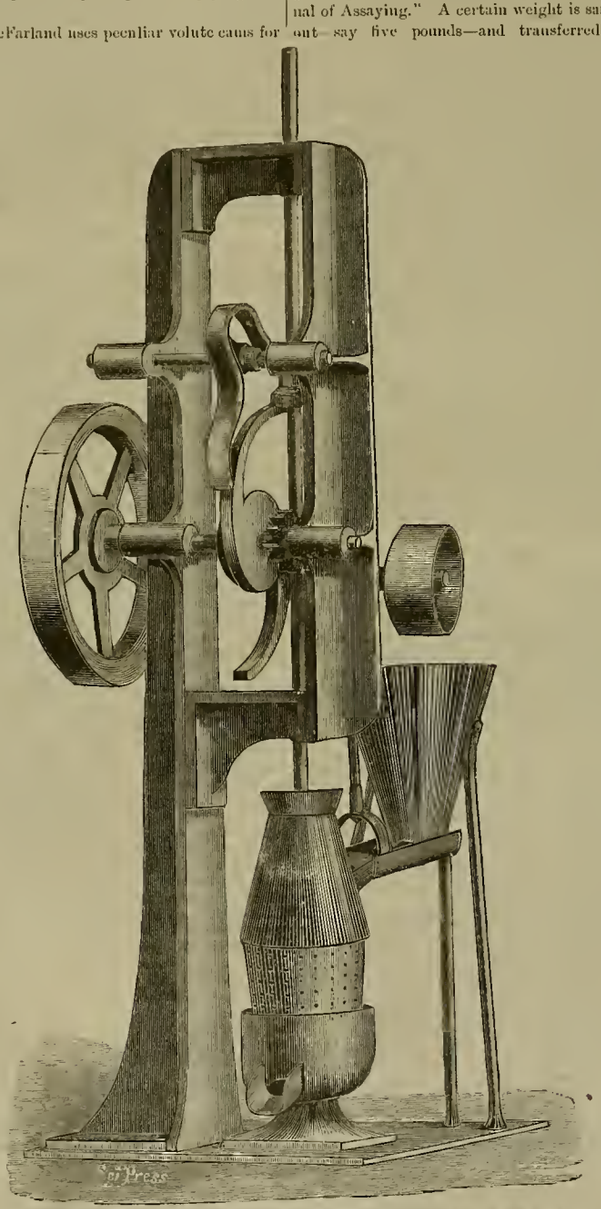
At a low rate of speed these arms would play no part, as the drop of the stamp would be fast enough; but at a high rate of speed, the rear arm would be forced out quickly enough to force the forward arm down upon the tappet and speed the stamp.

The principle of forcing the stamp down by which the speed and force of the blow is increased, as shown in this invention, can be applied to stamp mills of the usual construction having any number of stamps of any weight.

The engraving shows the device adapted for a prospecting battery with mortar and self-feeder, the entire mill being made to weigh about 350 pounds; the stamp weighs 20 pounds, and may be run 300 drops per minute. It is intended for working small rich mines, or to be used in large mills for testing small quantities of ore and for sampling. The self-feeding device consists of a small trough hinged at the end under the hopper, the other end being hung on a rod connected with a lever that the tappet strikes. The trough is jarred rapidly, as the stamps drop, and, being slightly inclined, the ore from the hopper feeds into the battery. The mortar, fitted for one stamp, is circular and discharges all around. Without the mortar and self-feeder shown in the cut, it is designed for assay offices, a heavy mortar of the usual style being substituted.

The frame is made so as to allow the stamp to be raised a sufficient height to be entirely out of the way in adjusting or emptying the mortar.

Mr. McFarland uses peculiar volute cams for



McFARLAND'S PROSPECTING BATTERY WITH SELF-FEEDER.

lifting the stamps, which are the subject of a previous patent. These are flat plates of steel, or other elastic metal bent in a proper curve. These elastic volute cams are not liable to fracture, nor do they cause a severe jar or shock when engaging with the tappets. The power is not applied direct to the cam shaft, but to a gear which engages with a pinion on the cam shaft, as the engraving shows. The mill can be run by hand or by any other available power.

Moisture in Ore.

It is frequently a matter of importance to know the amount of moisture or water contained in an ore. A simple manner to determine this, and a satisfactory one at that, is given by Brown in his recently published "Manual of Assaying." A certain weight is sampled out—say five pounds—and transferred to a porcelain capsule the weight of which is already known. The capsule and contents are then exposed to steam heat, in any convenient way, for half an hour, and then weighed. It is then heated half an hour longer and weighed again. There should be but a slight difference in its last two weighings. The difference between the last weight and the original weight of dust and ore is the loss by driving off water. The difference divided by the amount of ore taken, and multiplied by 100, is the percentage of moisture in the ore.

Grizzly Flat Mines.

In conversation this week with Mr. Russel L. Dunn, who has lately made a professional surveying visit to Grizzly Flat, El Dorado Co., in this State, we glean some items of interest from that interesting locality. The district was worked years ago, but was abandoned for a long time, until some three years since. At that time the place again attracted attention, and considerable work has been done in developing the ledges. It is now the principal camp of the county. The Mount Pleasant is the principal mine, being the most developed. Among other important ones are the Mount Hope and Black Hawk, the north and south extensions of the Black Hawk, Treat, Treat Extension, Sacramento and Grizzly.

Nearly all these mines are opened by tunnels, and most of these are on the southeast bank of the north fork of the Cosumnes river. None of these tunnels are very long, most of them being between 200 and 300 feet, only one being 400 feet. There are a few opened by shafts, and one or two mines have steam hoisting works.

The ledges run generally in a northeast and southwest direction. They are mostly "blind," only occasional bunches of croppings being found. The ore is free milling and pays from $15 to $50; the average being $20 to $25 per ton. The ledges average about two and a half feet in width.

Some 30 or 40 stamps have been added to the milling capacity of the district, and others are contemplated. These are private mines. The camp is the best in El Dorado county, and promises very well, work being brisk, and developments being rapidly pushed.

Rosette and Japan Copper.

"Rosette" and "Japan" copper are commercial varieties of copper, the surface of which presents a peculiar red color, due to a coating of oxide of copper formed by throwing water upon the surface of the metal while still in a heated state. The "rosette" variety produced at Chessy, in France, in the Hartz, in Sweden, China, etc., is obtained in thin plates or disks, by projecting water upon the surface of the cake of fluid metal and removing the crust so formed as quickly as solidified, proceeding thus until the whole of the copper is removed in the forming of thin disks, which are then immersed in water as quickly as possible to prevent their further oxidation. This variety contains a considerable amount of the red oxide of copper, and has a dull, red-short fracture. It requires refining before it can be hammered or rolled.

The Japanese variety, instead of forming disks, occurs as small ingots, strongly colored a purplish red tint by throwing them into water as quickly as solidified. It is principally made for exportation to the East Indies. In the preparation of Japanese copper the ore is first roasted in kilns with the required fuel, and the roasted ore is smelted with charcoal in small primitive furnaces supplied with a blast from bellows worked by hand. The regulus or coarse metal so obtained is again roasted and re-smelted, after which it passes to the foundry, where it is refined under a blast of atmospheric air, and the refined metal is then melted in crucibles and cast under warm water into small ingots. In this manner the ingots are obtained with a clear, bright surface of a rich red color.

DAKOTA Territory is four times as big as Ohio.

CORRESPONDENCE.

The Denver Exposition.

[From our Traveling Correspondent.]

EDITORS PRESS:—I send you some notes from the second annual National Exhibition (Mining and Industrial) held at Denver, Colorado, by the Exposition Association, of which H. A. W. Tabor is President, W. A. H. Loveland General Manager, Th. B. McNichol Secretary, F. H. Wilson Assistant Secretary, and Joseph T. Cornforth Treasurer. Though more than a month has passed since the formal opening of the grand pavilion, yet it seems to be only in its opening stages, as new exhibits are constantly arriving and are being put in order.

One remarked, as we approached the grand and showy brick exhibition structure, with its dozen turrets and towering spires, "Denver does not do anything by halves; all her public works are on a substantial scale—churches, schools, city and county halls, firemen's quarters, etc., are all first-class here in Denver." The accommodations are ample, and the building well adapted for a display of double the amount of material now exhibited, and not be at all cramped. Many prominent counties and localities are not yet represented. It is claimed by some that many who engaged spaces for exhibits have not yet brought forward their articles, and that Denver business-houses and industries are not so largely represented as they should be. Yet, waiving all these controversies, this is a grand display of the Centennial State in her youthful strength. Being at her own capital, she can more conveniently make a full display of ores and heavy machinery and agricultural exhibits. But being of a national character, it gathers a wider range of interest; it makes it a social union of some importance.

Minerals from the Southern States.

When I saw that freight car unloading its hundred or more cases of ores, minerals, and various specimens of natural and labor resources, it added not a little to the interest to notice that the car was itself a specimen of work done at the Richmond and Danville Railroad Company's shops in Virginia; that the exhibit was from the Southern States, through which their system of railroads runs, viz., Virginia, North Carolina, South Carolina, Georgia, Alahama and Mississippi. This certainly looks like a united nation, when the same car can come over the Atlantic coast and then across to any extent, only limited by the oceans, and no changing of lading, or any inspection stations to delay. But the pleasant surprise is that they come right here to the geographical center of the nation, and to a hoasted mining center, and make a spread out of over 14,000 pounds of exhibit in the most systematic order, and embracing a larger variety of ores and more of rare specimens than is to be found in any other one collection of minerals now offered. Of wood specimens—all native of these Southern States—near 100 varieties are shown. The native tobacco leaves, of rarest varieties, grown only in Virginia and North Carolina, are elegantly displayed in light glass-covered cases. This whole exhibit is in charge of Mr. C. C. McPail, Chief of the Bureau of Mines and Manufactures of the Richmond and Danville railroad system, who is accompanied by an able assistant.

The table room occupied by this exhibit is over 1,100 feet surface. The small and very rare specimens occupied an upright showcase, which was freely opened and very satisfactory, examinations allowed, and interesting explanations given. The first sample taken out was a crystal of Hiddenite, named after Prof. Hidden, of New York. This is a new gem, a new discovery, and a new composition. It is very rare, and is the same degree of hardness as the emerald; very perfect and usually free from flaws or cracks; shape, long, slender, even-sided; only two perfect cleavages or perfect sides; color light green; worth $120 to $130 per carat, and larger ones a higher ratio of value, as in diamonds. These gems have sold in New York for higher rates than diamonds. In the same mine are found emeralds. The next taken out was a *staurolite*, a very peculiar crystal found in North Carolina hexagon with parallel ends, and found generally one running through another. A curious peculiarity in regard to them is, that in one locality they may join at right angles, all of them, and in another locality join only at an angle of 60°, and in another mine they find them only single and very flat, but with the edges off enough to show six sides, but very different from the quartz crystal; not bright and polished, but opaque, with ashy-yellow shades.

Rutile is a large smooth black colored crystal, but when it is pulverized is red, and is used by the dentists to color their mouth work red. A rare quartz crystal with the satin fibers of asbestos incorporated in the formation is exhibited. Also an equally rare quartz gem, containing a cavity partially filled with a liquid clear and pure as the Denver artesian water.

I will not now say just what that liquid is, for it might be presumed to be presumptuous, as the young man remarked, "no one he thought could tell," and he was told that as soon as relieved from the confinement it evaporated before any analysis could be made. Then he brought out a large black crystal, he called tourmaline. Here again are crystals of corundum from Anderson Co., South Carolina, next to diamond for hardness; this is valuable in lapidary work. When free from flaws and of pink color, it is a ruby, and when blue, a sapphire; when pulverized it forms the best emery. These were long sheets of "flexible sandstone from North Carolina; found in flakes, and is the bedrock of the diamond fields. Some diamonds have been found in this location.

Among other things are beryls; monazites in connection with feldspar; fancy cut marbles; rich specimens of ores from N. C., assaying $504.42 in silver, and $6.50 in gold per ton; another gold, $223.24 and $9.90 in silver. The samples of mica, 15 inches long, are excellent. I do not attempt to mention anything more than a few rare samples taken from the single show case that is well filled with gems and rarities. The 1,100 feet of table surface I leave untouched for the present, with the Commissioner who is able to speak freely, both of the minerals and also of the advantages of the country from which they are mined. I simply introduced this exhibit first, because it seemed to be from the most distant section and more likely to feel as a stranger here. But to be consistent I would have to go on and introduce many of our old Yankee States with their mowers, reapers, binders, traction road engines, plows and cultivators, showing up their fancy family cool safes, refrigerators, and Arctic cream preservers, and such notions as they only can invent; Studebaker, Fish, *et al.* wagons, too nice to use. To introduce all these parties formally would take too much time, for they are great revolutionists and each great in their peculiar sphere. So I will pass on to the big thing of the whole exposition, the heart, the life, the breath, the moving, active power,

The Massive Corliss Engine.

It is of 150 horse power, smoothly and noiselessly moving (with a fly-wheel of 30,800 pounds) all the machinery in the building, yet so free from any jar is it, that a nickel would lie quietly on the steam chest. This fine specimen of the skill of the Frazer and Chalmers Chicago Machine Works, was erected by L. C. Trent, in charge of the Denver branch of Frazer & Chalmers' business. The same engine served the exposition last year. This firm has a large variety of machinery on exhibition, in charge of skillful mechanics showing them in motion. Their varied mining machinery exhibits and attentions to the inquiries of strangers has added much to the success of the exposition, and will no doubt increase Trent's orders for pumps, crushers, engines, concentrators and smelting plants. They exhibited a Comet crusher that will crush ore at the rate of one ton per minute. The material was too scarce to see its capacity tested, but No. 1 will do that much work. This machine has a strong funnel-shaped or flaring hopper, within which is a heavy solid center post, with corrugated surface. This center post at the bottom has a slight oscillating motion, and that motion brings it constantly in crushing contact with the ore that is being fed in the hopper. Near this machine was a new notion of

A Quartz Pulverizer,

And not a crusher—the Sturtevant—patented 1882, Boston, Mass. It is in charge of Mr. J. S. White, of Denver. This machine came all the way from Boston, to show that the old straight line of drop stamps, with its noise, must step down and out for a small cylinder, with two revolving heads turning in opposite directions at the rate of 3,600 revolutions per minute, thus causing the rocks, as fed into the small space between the two heads, to revolve rapidly and thoroughly, and very quickly pulverize on its neighboring rock. It is so arranged that the contact with metal is almost entirely avoided, and that portion that is exposed is reversible, and cheaply replaced by new castings, the part wearing being simply two casing rings, half an inch thick, six inches in diameter, and three inches wide. This little model mill, it is claimed, will crush 8 tons in 10 hours. The full working size, of 15 to 20 inches diameter, will rapidly break up bowlders of 8 or 10 pounds weight, and reduce them to finest powder. The extreme lightness of the plant, and its marvelous ability to convert rock to dust, as was witnessed on several occasions by the visitors, made a favorable impression. Some very ingenious appliances of suction blower, dust chamber, etc., prevents any annoyance or loss from escape of dust from the machine. When the machine is in motion, the rock, by its centrifugal force, is first distributed against the inner surface of the cavity of the machine, in the form of two hollow cones, with their bases touching in the center of the mill, and moving in opposite directions, grinding the rock on the rock, while the metal of the machine is almost entirely shielded by a rock cone formed within, and lies fixed to the inner surface while the contact rocks are grinding. Some of the quartz men who looked at its workings feel much interest in its success. "This man or some other will make this principle a success." "This is exactly the principle we want, for the rock to wear the rock." And such expressions showed their faith that success will yet come in this line of experiment, even if this should be found in some respects imperfect.

The Tasker improved pulverizer, from Philadelphia, placed by the South Pueblo Machinery Co., of Colorado, was not started up. It claims to crush with its seven-ton machine, sixty tons through a No. 60 screen in twenty four hours. Steel cannon balls in a fast-revolving cylinder do the work. Cost of machine, $4,000.

H. N. Nichols & Co., Denver, showed the Sharpneck steam stamp, operating two stamps in one mortar, 120 drops each per minute. This applies steam direct to each stamp, and thus avoids the necessity of engines for crushing. Four stamps are crushing thirty tons daily in actual working at North Platte Mining Co., Gold Hill, Col., saving a very large percentage of cost over an old-style twenty-stamp battery, which took nine cords of wood daily to crush eighteen tons of ore, while with four stamps they are now crushing thirty tons daily with three cords of wood.

The Frue Vanner

Machine exhibited by Frazer & Chalmers is running successfully, and beside it, Tasker's machine, claiming to be an improvement on Frue's; but the matter will probably be settled in court on charge of infringement now pending. The Colorado Machinery Co. had a large exhibit. Their large compound air-compressing engine, built by the Norwalk Iron Works Co., South Norwalk, Conn., is a fine piece of mechanism, and led many visitors to ask for its uses: "Pressed air?" "What for?" etc. For driving rock drills, engines and pumps in mines and tunnels; for displacing water in covered caissons and submerged buoys; used in raising sunken ships; for the sand blast; in carving stone or glass, thus doing the work of 100 men in etching and ornamenting glass. This sand blast is one of the great American inventions. The compressed air is used for pneumatic elevators, for forcing liquids, acids, etc., upward by surface air pressure, for refrigerating processes, and various mechanical, philosophical and chemical uses and purposes. It is a machine that forces just common air into useful services; and so great is the success already made, none dare prophesy what may yet be accomplished by this simple element and man's inventive genius. Connected with the mining machineries, there were several steam hoisting works, very near compact, and fine specimens of working machinery exhibited by different firms. Also, competing steam pumps of the latest and best patents, running constantly, showing how easy and accurately they could be gauged by the engineer to pump slow or fast. We could not pass this point without a close inspection of Mr. Huson's

Wire Cable Tramway,

To convey ores from the mine to the mill or smelter, over rough mountain cliffs and chasms, by an endless wire cable that is moved by steam or water power. The moving cable is supported by grooved wheels elevated as convenient, and on this cable are secured suspension boxes or buckets, which are loaded and unloaded automatically with the most satisfactory precision. This is certainly a grand achievment of success. It is claimed to be far superior to the great English tramway erected in White Pine, Nev., for the Eberhart mine. This is so simple and safe that it will answer well for various transportations in places of dangerous travel, and across streams and chasms. The inventor is off superintending the erection of trams in the mines, and trusts to another to run the machine here exhibited. This may yet form a safety valve for those suffering to have aerial traveling, and take the place of ballooning for the novelty of the sensation.

But here comes L. C. Trent (Frazer & Chalmers), agent for Hallidie's wire tramway, and having no less than eight plants of Hallidie's tram in full and successful operation in Colorado, and he claims that Mr. Huson is infringing on the patented rights of Hallidie's tram. One of Hallidie's trams is in use at the Iowa and Consolidated mining company at Summitville, Col., and Mr. John H. Gear, President of the company, says of it: "This spring I placed the engine, boiler and crusher in place at the mine, and on the 2d of this month (August) I commenced crushing ore at the mine for the tramway to carry to our mill, 3,700 feet. The tramway works to a charm in every particular. It will transport to our mill in ten hours more than our mill, forty stamps, can crush in twenty-four hours. I would say, at a speed of 250 feet per minute, that is, if the buckets are fully loaded, it will carry nearly 200 tons in twenty-four hours. It beats bull teams badly."

And here is Mr. Watson's elevated railroad in practical operation, a bicycle single rail railroad, with which he proposes to cheaply avoid all cost of grading of ground, all difficulty of snow drifts, much of the cost of ordinary track laying, and a large per cent saving on the materials used, and in the end have a safe road. He even imagines he sees the big wheat grower inclosed not with a barb wire fence, but with his railroad track, and instead of hauling off his grain in wagons he will drive his trains to the different depots on the border of field, and there load the grain direct on the cars, and when loaded a span of horses could run it out on to the direct or main line. The model was quite crude, and yet it performed well on a true circle track of eight feet diameter. Mr. Watson is quite aged now, and may not realize or see fully accomplished all that he supposes of the possibilities in his invention which he has patented; but I see no reason why it may not yet be adapted to useful purposes. There would doubtless be a large percentage in favor of success in applying it to a full sized working machine instead of a small model.

I will let this suffice for first talk of the Denver exposition and rest here for the present letter, and in next talk some of minerals, etc.

B. W. CROWELL.

Denver, Aug. 30, 1883.

Good Fortune Camp.

San Andreas District, Socorro Co., N. M.

EDITORS PRESS:—I send you a short account of our mining district, that may be of interest to prospectors and those seeking for a favorable place to invest in mines.

We are located about 35 miles east of the Rio Grande river, in the San Andreas mountains, in the range extending north and south from near Santa Fe to the old Mexico line, between the Pecos and Rio Grande rivers, the whole range being mineral bearing in gold, silver, copper, lead and coal.

The district, extends from the Fort Stanton road on the north to the mouth of Antelope Canyon on the south, and from the Gypsum plains on the east to the Jornada de la Murta on the west—a tract of about ten miles square.

It was discovered in the spring of 1881 by Messrs. Heath, Miller and Cole, but did not attract much attention, as the first ores discovered were low grade argentiferous galena on the surface.

Since then, as the district became more fully prospected, a number of excellent copper claims were located; first at the mouth of Bear Canyon, then north along the edge of the Gypsum Plains toward Soledad mountain (or Salinas Peak) being mostly in a granite formation.

Then came the discovery of more copper in Red Canyon to the west. Numerous locations made in the Red Hills (a sandstone formation) and on the contact a limestone formation. Chloride ores were then found, the assays running into the hundreds, Mr. Carr being the fortunate discoverer.

Copper again was found to the north on the edge of the district, the leads extending across the Fort Stanton road in the neighborhood of the Dripping Springs.

The galena silver leads are numerous, running north and south between porphyry and limestone, and readily traceable for several miles.

There are also a number of iron capped leads, that so far as known have almost invariably turned out to be good mines wherever found in in this Territory, but so far they have been but little worked in this district.

Excellent galena silver claims are owned by Messrs. Carleton, Taylor, the Friend brothers, Smith and Hamlin. Mr. Hamlin's claims are now being worked by a Chicago company. The Good Fortune mine has changed hands. They have a shaft about sixty feet. High assays were reported by the former superintendent, Mr. Phillips. The new company is expected to commence work some time this autumn. The Eureka copper mine and group of claims have just been bought by a St. Louis company, who are much pleased with their purchase and expect to begin work at an early day.

Negotiations are now going on for the purchase of a group of copper claims owned by the Messrs. Friend, Cooper, Green, Stevens and others, situated in the northern part of the district, near the Stanton road. Messrs. Miller and Carr also expect to complete a sale of their copper mines.

The Messrs. Mooney, Thompson, Easter, Cooper, Taylor and Smith, also have some good copper properties in the Red Hills. Carleton, Welch and McDonald have located claims in Antelope canyon showing copper glance. The Mexico and U. S. Syndicate are joint owners with Mr. Smith, of the San Andreas, of a number of galena silver claims, and iron-capped leads. The Cooper brothers and Howerth are working on the Homeward, and are down over thirty-five feet.

Col. W. W. Alexander and his partner are at work on their copper mine in Antelope canyon. Mr. Smith is opening up his Red Hill copper mine. Considerable work has been done on the Big Casino and Little Casino mines, the White Cliff, Asteroid, Black Tail, Jim Blaine, Great Southwest, and Jo Dandy claims. Take it altogether, the prospects of the San Andreas district are brightening. It only requires the influx of capital to make this one of the most flourishing mining districts in New Mexico. The miners and prospectors here have held on bravely, through good and bad report. They were run out three times by the Indians the first year, and then came a long season of discouragement.

Now fortune seems to smile on them, and all are looking forward to reaping the reward of honest toil, and be recompensed for the years of privation and hardship undergone.

There is no more favorable place for capitalists to seek investments in mining properties. There is an abundance of silver, copper and lead ores, magnetic iron, etc. The ores are easily reduced.

It will well repay mining men and capitalists to pay a visit to "Good Fortune" camp, in the San Andreas mountains. The camp can be reached either from San Marcial, Engle, or Lava stations, on the Atchison, Topeka and Santa Fe railroad. BUENA VENTURA.

Good Fortune Camp, San Andreas District, Socorro Co., New Mexico.

IN the Blue Wing silver district, east of Bannack, Montana, there are more miners at work at the present time than there have been for a number of years past. Many of the mines of that district are looking well, and are producing a good quality of shipping ore. The Blue Wing district is looming up, and the ore yield for this winter will be of considerable value.

MECHANICAL PROGRESS.

Improved Machinery.

Improved machinery enables a certain number of men to produce more of any kind of goods than they could before the introduction of such machinery. This, unless there is something done to counteract it, necessarily causes overproduction. The proper and natural way to balance this is to shorten the days of labor, or lessen their number. The inevitable result of the employment of machinery is either to shorten the days of labor or to decrease the number of persons employed; but to do the latter would be to pauperize a portion of the people. It would be the wisest and most humane plan for workmen to labor a less number of hours than the average in times of depression, and to work a greater number of hours than the average in times of more than usual activity. This would be better than to discharge surplus hands in the one case, or to rake the world for additional and inferior ones in the other. In the one case, it would divide the burden of depression equally among all the workmen, instead of placing it upon the shoulders of the few and allowing the many to escape, and in the other it would obviate the necessity of employers engaging inferior workmen, with all the attendant evils. This plan, if put in operation, would also tend to make prices more uniform, by preventing an accumulation of unwieldy stocks during times of depression, and by insuring against scarcity in times of activity; for in many cases manufacturers accumulate larger stocks than they otherwise would, because they dislike to discharge any of their employes. They dislike to do this for two reasons: first, because it often causes distress; and second, because when they again need their discharged men they may not be able to get them. Thus we see that the regulation of the hours of labor in accordance with the demand for the products of labor would tend to regulate stock, and therefore demand and prices, and consequently the demand for labor. It would also obviate the expensive necessity of manufacturers keeping in their works a great deal of machinery that is seldom called into play except in times of great activity, and which also often helps to make stocks too large. These few hasty thoughts might be pondered with profit by those most interested.—*Iron Age.*

Iron Shutters vs. Wood Incased in Tin.

Mr. Edward Atkinson, in a note on the subject of iron shutters for buildings, says:

Of all the materials in common use, and which are commonly depended upon for preventing destruction by fire, there is none so treacherous as unprotected iron, with the possible exception of granite. Iron doors and iron shutters may have occasionally appeared to prevent the passage of fire through a window or doorway, but such successes can only have been attained either by their not being subjected to great heat, or else by their being drenched and kept cool with water. Whenever and wherever they have been exposed to severe heat, they have been so quickly warped and twisted as to have become practically useless as safeguards, while they have often prevented access to buildings, and have thus greatly increased the loss or damage from the fire raging within. There is nothing yet invented which can be said to be absolutely fire-proof by which window spaces or doorways can be protected; but the heavy wooden door or shutter incased in tin will retard the action of fire in sufficient measure to give the firemen a fair chance to put it out in the room in which it starts. If two thicknesses of inch board (pine preferred, because it does not warp) are nailed crossways, and fully incased in tin, locked and soldered, and thoroughly nailed under the locking, the outer surface of the wood under the tin will be speedily reduced to charcoal by the action of heat through the combustion of the small amount of oxygen under the tin. The charcoal itself then becomes a very effective non-conductor of heat, and if the tin is tight, so that no further supply of oxygen reaches the unburnt wood beneath the charcoal, it will remain cool and strong for some hours, thus giving time to control the fire where it starts.

The Characteristics of Good Wood.

Rankine says that there are certain appearances characteristic of good wood, to what class soever it belongs. In the same species of wood, that specimen will in general be the strongest and most durable which has grown the slowest, as shown by the narrowness of the annular rings. The cellular tissue, as seen in the medullary rays, when visible, should be hard and compact. The vascular or fibrous tissue should adhere firmly together, and should show no woolliness at a freshly cut surface; nor should it clog the teeth of the saw with loose fibres. If the wood is colored, darkness of color is in general a sign of strength and durability. The freshly cut surface of the wood should be firm and shining, and should have somewhat of a translucent appearance. In wood of a given species, the heavy specimens are in general the stronger and the more lasting. Among the resinous woods, those having the least resin in their pores, and among non-resinous woods, those which have the least sap or gum in them, are in general the strongest and most lasting. Timber should be free from such blemishes as "clefts," or cracks radiating from the center; "cup shakes," or cracks which partially separate one layer from another; "upsets," where the fibers have been crippled by compression; "windgalls," or wounds in a layer of wood, which have been covered and concealed by the growth of the subsequent layers over them; and hollow or spongy places in the center or elsewhere, indicating the commencement of decay.

A NEW METHOD OF FORMING WIRE ROPE.—Messrs. Craddock & Co. of Wakefield, England, are now manufacturing a special rope in which the wires and strands are both twisted in the same direction, thus giving a much longer surface of the wire exposed to friction, which lessens, if not entirely removes, the cause of wires breaking on the crown of the strands; and as the working of the rope around drums and pulleys bends the wires in an oblique direction, the greatest amount of wear possible from the wires is secured, as they will not break until too much reduced, and become therefore too weak for their work. The wires in the strands on this principle have a longer bearing one against another than in the ordinary system, and prevent much injury which results from the wires in each adjoining strand cutting into one another. There is claimed for this rope greater durability and immunity from wires breaking when but slightly worn.

A SUGGESTION comes from England, which spelter manufacturers would do well to consider seriously. All over the world, spelter is cast in thin slabs, probably because it has always been done so since spelter was made. Mr. J. B. Sharp, of Birmingham, urges that in that form it is about as bad as it could be for causing loss by volatilization, when melting in the preparation of copper-zinc alloys, and for retaining lead impurities, which adhere to the lower part of the film in thin flakes which are not removable. He insists that the best way would be to cast the spelter in the form of round 3 or 4 inch ingots, vertically, keeping the mold hot when casting and allowing it to cool slowly. The form would be more convenient and more advantageous for remelting and the lead would gather at the bottom in a piece which could easily be detached.

FLANGELESS WHEELS.—On the Hamburg tramways a number of cars with flangeless wheels, much like omnibuses, and with turning gear, are working. To run on the lines, these cars are fitted with a shaft in front of the front wheels, this shaft carrying on a lever a disc wheel which the driver can lower into the tramrail groove as he requires, or raise it when it is necessary to get out of the way of obstructions. The arrangement works well, saves a lot of trouble, and the cars run easier than those with flanged wheels.—*Engineer.*

GRINDING metal surfaces as a method of finishing or reducing, says the *American Machinist*, is every day coming into greater use. Another step in this progress is made by an invention of Wm. B. Fenn, Meriden, Conn. This consists of a grinding and polishing machine arranged so that the work will be automatically passed beneath the grinding and polishing surface, or brought against it at any desired angle. The work is transferred and held by movable carriages which are capable of a wide range of position.

OUR WOOD-WORKING MACHINERY.—It is an indisputed fact that American wood-working machinery is preferred in most foreign countries to that of any other make. We mean by this those countries in which no such machinery is manufactured. In fact, not a few of our machines find their way into England, France and Germany each year; but who ever hears of foreign wood-cutting machines coming to America? In plain truth, our wood-working machinery, like our agricultural implements, beats the world.

GRINDING SURFACES.—If great accuracy be desired in work that is to be ground, use a wheel that has a hard metallic grinding face, as cast iron or brass, or the wheel may be coated with hard type metal. Emery and oil may be used on the wheel; or it may be imbedded in the wheel when the surface is of type metal. If a fine surface or a high polish be desired, a wheel coated with soft lead may be used and fine emery applied. With a scanty supply of emery a fine finish can be obtained.

STEEL STAMPING PLATES.—Liverpool advices state that steel stamping plates have displaced the charcoal tins almost entirely, but the steel-plate rollers complain that the prices are too low. Tinners offer less for steel than for charcoal plates, notwithstanding the former are more regular in quality.

THE Westinghouse brake has become so thoroughly recognized as the best device for stopping railroad trains that it is now being very generally applied even to freight trains. It is said that the Westinghouse Co. have orders now on hand to fit up not less than 60,000 cars with this device.

SHRINKAGE in lumber varies according to the tree from which it is made. Oaks will shrink in drying a half inch to the foot, while the redwoods of California show no perceptible change, and the heavy Eastern or South American woods lose but little.

SCIENTIFIC PROGRESS.

The Mysteries of Nature.

The process by which food is converted into living tissue is wonderful and mysterious. "Can there be a more striking metamorphosis than that of the constituents of the egg (albumen, yolk and egg-shell) into the constituents of the young bird (flesh, bones, feathers, etc.)? or the conversion of milk, which constitutes the sole nourishment of so many young animals, into flesh, blood, etc.?" There can be no doubt that chemical changes take place in the living animal as they do in plants, but they are far more mysterious, and more complex. It is a well recognized fact that the body is daily undergoing just such changes as occur after death. From the moment of birth until the hour of final dissolution the body is constantly dying. The difference between the body while living and after death is that in life it is able, by the process of nutrition and assimilation, to repair the waste that is constantly going on, while after death waste goes on without repair, so that the body is finally resolved, dust into dust. It will be observed that the body is not resolved into any of the organized elements that supported it during life, but into the inorganic elements from which his food originally drew its sustenance. There is no doubt, also, that these inorganic elements, resulting from the decay of animal substances, may again enter into the formation of vegetables. But this subject is exceedingly complex. The following, which was written by Secchi, the illustrious physicist, shortly before his death, probably contains the germ of the whole question:

"If it be said that a special principle is necessary to produce and to preserve a certain series of operations, without which the animal would yield to ordinary chemical forces, it is true: but if further than this, it is contended that in the living animal there is in the action of the vital elements a force independent of the ordinary molecular action, and that this depends on a chemical action different from that which takes place in organized bodies, it is false."

This daily waste and decay is replaced by the action of the organs of digestion and assimilation on the various substances introduced into the stomach and known as food and drink. It becomes, then, a question of great importance to every one to know from what kind of food he can best renew the daily waste and furnish a fresh supply of healthy blood to feed the tissues that are decaying. The question of heredity is, for some, a very important one, as influencing their health and the duration of life. The question, "What to eat?" is of the highest moment to every one.

There are two conditions necessary to carry on the process of nutrition—one, the ability, on the part of the organs of digestion to take the nourishment from certain substances which are called food; the other, some principle in the food which yields to the organs of digestion the required pabulum, by which the body is enabled to grow, and to maintain its strength by repairing the waste which is constantly going on in the system.

Electricity Not a Form of Magnetism.

Prof. Hughes has recently advanced views about magnetism, which, if accepted, will largely modify the position which science assigns to this property. He asserts that where there is no apparent magnetism, or the magnetism is neutral, there is not, as has been supposed, an indifferent turning of the molecules in all directions, with consequent balancing of influence, but, on the contrary, there is a perfectly symmetrical arrangement, the molecules (or their polarities) arranging themselves so as to satisfy their mutual attraction by the shortest path, and thus form a complete closed circuit of attraction. When magnetism becomes evident, the molecules (or their polarities) have all rotated symmetrically in a given direction, but the symmetry of arrangement is such that the circles of attraction are not completed except through an external armature joining both poles. Again, he shows that we have permanent magnetism when the molecular rigidity retains the molecules (or their polarities) in a given direction, and transient magnetism whenever the molecules are comparatively free. Prof. Hughes also shows that the inherent polarity or magnetism of each molecule is, like gravity, a constant quantity, which can neither be generated, nor augmented, nor diminished, nor destroyed. Neither can magnetism be changed to any other form of force or property of matter. Electricity may be generated by magnetism, just as light and heat (as in the case of the sun) may be generated by gravitation; but electricity is not a form of magnetism any more than light or heat is a form of gravity.—*Contemporary Review.*

The Upper Limit of Human Audition.

This subject has recently been studied by M. E. Panchon, and his results have been communicated to the French Academy of Sciences. The notes were produced by a powerful syren of the kind invented by Cagniard-Latour, and actuated by steam. The highest audible notes produced in this way had 72,000 vibrations per minute. M. Panchon has also vibrated metal stems fixed at one end, and rubbed with cloth powdered with colophane. In diminishing the length of the stem the sharpness of the note is increased. Curiously enough, he finds that the length of the stem giving the limiting sound is independent of its diameter; and for steel, copper and silver the lengths are in ratio to the respective velocities of sound in these metals—that is to say, as 1,000 for copper, 1,002 for steel and .995 for silver. Colophane appears to be the best rubbing substance. When the acute sound ceases to be heard, the sensitive flame of a gas jet is still affected by it. While upon this subject, we may mention that Mr. Francis Galton has recently invented a "hydrogen whistle," which enables him to obtain notes far above the upper limit of human hearing, his object being to test the hearing powers of insects, which, as is well known, have very acute ears. The number of vibrations produced by a gas in a whistle is universally proportional to the dentisty of the gas, and, as hydrogen is 13 times lighter than air, the sounds produced by it in a given whistle are 13 times shriller—that is to say, the pitch is 13 times higher. Mr. Galton has made a whistle .14 inch long and .04 inch in diameter, which with hydrogen gas, gives a sound of 312,000 vibrations per second. The whistle is fitted with a piston at its base to regulate its length, and it is probable that still higher notes can be obtained with a shorter length.

HARDENING SOFT LIMESTONES.—According to *Engineering*, alkaline silicates are occasionally employed to give certain limestones a greater hardness. When the limestone is saturated with a solution of these salts, it quickly becomes covered with a more or less perfectly impervious glazing, but it is difficult to secure the correct proportions, and soluble salts and water may be left within the stone, the latter causing slow disintegration from subsequent freezing, and from other causes. To obviate these disadvantages, M. L. Kessler proposed, in a paper recently presented to the Academy of Sciences of France, to use the fluor silicates of magnesium, aluminum, zinc and lead, instead of the alkalines used in the former processes. In this case, only insoluble salts would be formed throughout the stone, and a more homogeneous material would be obtained. If greater hardness is not aimed at, but only a granular, marble-like surface, it will be sufficient to make a paste of water and the powder of the limestone, to let this dry on the stone, and then to apply the silicate. By mixing this with the silicates of copper, iron, chromium, etc., the various colors of marbles may be imitated, and the color would, as in the natural rock, be uniform through the whole stone. The materials are not more expensive than those of older processes.

NITROGENOUS FERMENTS IN HUMAN MILK.—Bechamp has published a paper in *Comtes Rendus* on milk, in which he says that cow's milk contains two distinct albuminous substances besides casiene. One of these remains insoluble in alcohol after it has been precipitated by alcohol, and is an enzymotic substance which possesses the power of liquefying starch without first converting it into sugar. Dumas and Cahour have already proved that the enzymotic constituent of woman's milk possesses much greater power than that of cow's milk, nearly equal to diastase. Bechamp isolated the enzyme by the following process: Normal slightly alkaline woman's milk was carefully acidified with acetic acid, and then at least three times its volume of ninety-five per cent alcohol was added. The very bulky precipitate was collected on a filter, washed with weaker alcohol to remove the milk sugar, then with ether to remove the fatty portions, and then taken up with distilled water. After a few hours it is filtered. The solution thus prepared possesses to a high degree the property of liquefying starch and converting it into sugar. Twenty or thirty cubic centimeters of milk are sufficient to prove this assertion.

EROSIVE POWER OF GLACIERS.—Both from mechanical and physical considerations, Mr. A. Irving concludes that too much erosive power has been attributed by some writers to glaciers, and that it is doubtful if the work of actual excavation has been accomplished by them at all. He attributes the differential movement of glaciers to the following causes: 1. Crackling and regelation, as explained by Tyndall and Helmholtz. 2. Generation of heat within the glacier, as set forth by Helmholtz. 3. The penetration of the glacier by luminous solar energy, the absorption of this by opaque bodies, such as stones, earth, organic germs, etc., contained in the ice, and the transformation of it in this way into heat. To these causes he attributes the greater differential motion of the glaciers by day than by night, and in summer than in winter.

BLASTING paper has been made by J. Petry, of Vienna. It consists of unsized or ordinary blotting paper coated with a hot mixture of seventeen parts yellow prussiate of potash, seventeen of charcoal, thirty-five of refined saltpeter, seventy of potassium chlorate, ten of wheat starch, and 1,500 of water. When it is dried it is cut into strips which are rolled into cartridges.

ARTIFICIAL FILTERING STONE.—K. Steinman, a German, proposes filtering plates from the following mixture: Clay, 10 or 15 parts; levigated chalk, 1 part; glass sand, coarse 55 parts; glass sand, fine 25 to 65 parts; ground flint, 15 to 30 parts. The ingredients are mixed thoroughly in water, molded, and hard burnt.—*Dingler's Journal.*

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	No.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Alaska M Co	California	3	1 00	Aug 22	Sept 24	Oct 13	A Judson	320 Sansome st
Bodie Con M Co	California	3	50	Aug 4	Sept 10	Oct 10	G W Sessons	309 Montgomery st
Campo Seco Copper Co	California	2	10	Aug 10	Oct 1	Nov 20	D Buck	309 Montgomery st
Camp Eureka G and S M Co	Nevada	2	25	July 23	Aug 23	Sept 18	L Hermann	220 Sansome st
Chollar M Co	Nevada	12	1 00	Aug 2	Sept 6	Sept 28	W E Dean	309 Montgomery st
Day S M Co	Nevada	13	30	Sept 7	Oct 15	Nov 12	E M Hall	327 Pine st
Double Standard M Co	California	6	10	Aug 30	Oct 5	Oct 25	G W Sessions	309 Montgomery st
East Mt Diablo M Co	Nevada	3	05	Aug 13	Sept 17	Oct 8	G W Fisher	306 Pine st
Eureka Con M Co	Nevada	5	1 00	July 26	Aug 27	Sept 17	P Jacobus	309 Montgomery st
Kinkaid-Gravel M Co	California	13	05	Sept 11	Oct 17	Nov 5	H Kunz	309 Sansome st
Excelsior Water and M Co	California	5	60	July 6	Sept 15	Oct 6	W J Stewart	215 Sansome st
Equitable M Co	Utah	28	25	July 24	Aug 31	Sept 28	C J Collins	512 Montgomery st
Golden Fleece Gravel M Co	California	3	50	Aug 1	Sept 5	Sept 22	F Schirmeier	785 Folsom st
Gorilla M & M Co	California	2	21	Aug 23	Oct 3	Oct 31	A A Enquist	436 Montgomery st
Hale & Norcross M Co	Nevada	78	50	Sept 11	Oct 16	Nov 6	J T Lightner	309 Montgomery st
Homer M & M Co	California	3	10	Aug 2	Sept 8	Oct 2	F E Luty	330 Pine st
Lima Con M Co	Arizona	7	05	Aug 6	Sept 10	Oct 6	R D Hopkins	436 Montgomery st
McClinton M Co	California	9	05	Aug 30	Oct 4	Oct 24	G W Sessions	309 Montgomery st
North Gould & Curry M Co	Nevada	5	25	Aug 9	Sept 11	Oct 1	C H Mason	331 Montgomery st
Ophir M Co	Nevada	15	1 00	July 23	Aug 31	Sept 29	C L McCoy	309 Montgomery st
Pleasant Valley M Co	California	2	15	Sept 8	Oct 16	Nov 3	C E Elliott	327 Pine st
Potosi M Co	Nevada	13	50	Aug 13	Sept 17	Oct 8	W E Dean	309 Montgomery st
Pittsburg M Co	California	16	10	July 24	Aug 28	Sept 18	R Wegener	414 California st
Swansea M Co	California	3	25	July 21	Sept 1	Sept 24	M A Wheeler	119 Market st
Seaton G M Co	California	3	5	July 31	Sept 5	Sept 27	A Martin	525 California st
Sierra Nevada M Co	Nevada	7	77	Aug 9	Sept 12	Oct 2	E L Parker	309 Montgomery st
Silver Hill M Co	Nevada	19	05	Sept 3	Oct 8	Oct 30	W E Dean	309 Montgomery st
Tip Top M Co	Arizona	7	25	Aug 16	Sept 24	Oct 22	H Deas	309 Montgomery st
Virginia Con M Co	California	10	01	July 24	Sept 3	Sept 24	A F Benard	364 Howard st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Belle Isle M Co	Nevada	J W Pew	310 Pine st	Annual	Sept 27
Day S M Co	Nevada	E M Hall	327 Pine st	Annual	Sept 18
Golden Fleece M Co	California	F Schirmeier	510 Bush st	Annual	Sept 22
Grand Prize M Co	Nevada	E M Hall	327 Pine st	Annual	Sept 18
Hoguhn M Co	California	J M Moore	Montgomery Block	Annual	Sept 18
Mono M Co	California	G W Sessions	309 Montgomery st	Annual	Sept 20
Pioneer M Co		A Judson	320 Sansome st	Annual	Sept 18

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Kulwer Con M Co	California	W Willis	309 Montgomery st	15	July 2
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	July 19
Mt Diablo M Co	Nevada	R W Heath	318 Pine st	25	Sept 25
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	Sept 12
Silver King M Co	Arizona	J Nash	315 California st	25	July 12

Table of Highest and Lowest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Aug. 22.		WEEK ENDING Aug. 29.		WEEK ENDING Sept. 5.		WEEK ENDING Sept 12.	
Alpha	2.00	2.40	....	....	2 10	2.00	2 15	2.05
Alta	.60	1 05	.80	1.10	.85	1.50	1.45	1.60
Andes	.70	.85	.70	.75	.70	.75	.70	.75
Albion	....	.50	....	....	....	....	....	....
Argenta	.35	.55	.20	.30	....	.15	....	....
Atlas	....	....	....	....	....	....	....	....
Belcher	1.00	1.05	1.00	1.05	1 00	1.10	1.05	1.30
Belding	....	....	....	....	....	....	....	....
Best & Belcher	4.10	4.50	4.20	4.50	3.75	3.20	3.80	4 00
Bullion	1.10	1 20	1.00	1.10	.90	1.00	....	1.00
Bechtel	....	....	....	....	....	....	....	....
Belle Isle	.35	.40	....	.25	....	.35	....	.25
Bodie Con	....	.25	.15	.25	.15	.55	.55	1.15
Benton	.15	.20	.20	.25	.20	.30	.25	.35
Bodie Tunnel	....	....	....	....	....	....	....	....
Caledonia	.20	.25	....	....	....	....	.25	.30
California	.30	.40	.30	.40	.20	.30	....	.25
Challenge	....	....	....	....	....	.35	....	....
Chollar	3.10	3.30	2.70	3.20	2.60	3.10	3.95	3.00
Confidence	2.05	2.25	....	.35	1.90	2 00	....	2.00
Con. Imperial	....	....	....	....	....	.10	....	.10
Con. Virginia	....	.65	.65	.75	.55	.60	.55	.60
Crown Point	1.00	1.20	....	1.15	1.10	1.20	1.20	1.55
Day	....	....	....	....	....	.50	....	....
Elko Con	....	....	....	....	....	....	....	....
Eureka Con	6.00	6.25	6.75	7.25	6¾	7¼	7.50	8.00
Eureka Tunnel	....	....	....	....	....	....	....	....
Exchequer	.55	.75	.60	.65	.55	.65	.60	.75
Grand Prize	....	.30	....	.25	....	.20	....	.10
Gould & Curry	2 85	3 35	3.10	3.25	2.40	3.05	2.65	2.80
Hale & Norcross	6.30	6.25	5¾	6¼	3.70	4.95	4.00	4.70
Holmes	....	....	....	....	....	....	....	....
Independence	.50	....	.55	....	....	....	....	....
Julia	....	.15	.05	.10	....	.10	....	.10
Justice	.30	.35	.30	.40	.35	.65	.60	.80
Jackson	....	....	....	.50	....	....	....	....
Kentuck	....	....	....	....	....	....	....	....
Martin White	....	....	....	....	....	....	....	....
Mono	....	....	....	....	....	....	....	....
Mexican	3 35	3.80	3.65	3.85	3.45	3.50	3.30	3.70
Mt. Diablo	6.25	6.50	4.15	4.25	3.25	4.50	....	4 75
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	....	....	....	....	....	....	....	....
Northern Belle	6¼	6¾	....	6¼	6.00	6 75	6.00	.65
North Noonday	....	....	....	....	....	....	....	....
Navajo	2.00	3.20	2 95	3.00	2.80	2.90	2.60	3.55
North Belle Isle	....	.40	....	....	.55	.60	.50	.55
Occidental	....	....	....	....	....	1.50	....	1 75
Ophir	3.05	3.95	3.05	4.00	3.45	3.70	3.60	3.70
Overman	.40	.45	....	....	....	.35	.44	.50
Oro	....	....	....	....	....	....	....	....
Potosi	1.15	1.30	1.05	1 20	.75	.90	.75	.90
Pinal Con	....	....	....	....	....	....	....	....
Savage	1.85	2.55	2.40	2.60	1.85	2.20	1.90	2.15
Seg. Belcher	....	....	....	....	....	....	....	3.00
Sierra Nevada	4.2	4 70	3.75	4.30	3.10	3.95	3.20	4.30
Silver Hill	....	.10	....	.20	....	....	....	....
Silver King	6.50	7 00	7.00	8.00	....	8.00	7.50	8.00
Scorpion	.55	.65	.60	.65	.55	.60	.55	.60
Tuscarora	....	....	....	....	....	....	....	....
Union Con	5¾	6 25	5¾	6¼	5.85	5¾	4.95	5.20
Utah	2.00	3.20	2.90	3.20	2.60	3.00	2.60	2.80
Ward	....	....	....	....	....	....	....	....
Wales	....	....	....	....	....	....	....	....
Yellow Jacket	3.05	3.55	3 05	3 25	3.15	3.35	3.20	3.50

Sales at San Francisco Stock Exchange

THURSDAY A. M., Sept. 13		AFTERNOON SESSION.	
1550 Alta	1.60	700 Alta	1.45
100 Alpha	2.55	100 Andes	75c
200 Andes	75c	70 Alpha	2.65
10 B. & Belcher	3.60	300 Benton	25c
500 Benton Con	30c	10 B. & Belcher	3.80
400 Bodie Con	70@75c	300 Belmont	1.10@1.15
200 Belmont	1.20	50 Bullion	1.10
100 Belle Isle	30c	590 Bodie Con	10@1.10
70 Chollar	3.05	150 Belcher	1 20
350 Con Virginia	55c	400 Chollar	3.05
35 Confidence	2	55 Con. Virginia	55c
100 Crown Point	1.35	110 Caledonia	30c
50 Caledonia	30c	140 Crown Point	1 40
140 Exchequer	55@70c	100 Con. Imperial	10c
20 Gould & Curry	2¾	200 Eureka Con	8
160 Hale & Nor	4.05	200 Exchequer	75c
100 Justice	55c	165 Gould & Curry	2.70@2.75
50 Mt. Diablo	4.75	240 Hale & Nor	4@4.05
20 Mexican	3.20@3.25	300 Justice	55c
20 Navajo	2.60	100 Mexican	3.30
20 Northern Belle	6¼	500 N. Belle Isle	55c
90 Ophir	3.60@3.65	100 Ophir	3.70@3.75
350 Potosi	1.20	600 Potosi	75c
250 Savage	2.05	200 Scorpion	55c
125 Sierra Nevada	3.25@3.30	20 Seg. Belcher	3
50 Silver King	7.87½	400 Syndicate	15
100 Solid Silver	20c	220 Savage	2@2.05
100 Scop	ion 65c	100 Sierra Nevada	4.10
200 Union	5.85	100 Union Con	5
90 Yellow Jacket	3 25	10 Utah	2.65

FIFTEEN carloads of immigrants arrived recently in Toronto, from Iceland. There were 700 persons in the party, about 400 of whom will settle in the Western British Possessions. The others will take up land in the Western States.

The Coming Fairs.

This year's fairs promise to be of unusual interest, and to command the attention and patronage of the people to a greater degree than formerly. We give below a list of the coming fairs of which we have record of dates:

Mechanics' Institute Fair, in San Francisco, September 11th to October 13th.

Ninth District Fair, at Rhonerville, Humboldt Co., September 18th to September 21st.

Stockton Fair, at Stockton, September 18th to 22d.

San Mateo and Santa Clara District Fair, at San Jose, September 24th to 29th.

Twelfth District Fair, at Willets, Mendocino county, September 24th to September 29th.

Eleventh District Fair, at Quincy, Plumas county, September 24th to September 29th.

Oregon State Fair, at Salem, September 17th to September 22d.

Contra Costa County Fair, at Pacheco, October 1st to October —.

Seventh District Fair, at Salinas City, Monterey county, October 2d to October 6th.

Tenth District Fair, at Yreka, Siskiyou county, October 3d to October 6th.

Mechanics' Institute Fair, Pavilion, Portland, Or., October 8th to 20th.

Sixth District Fair at Los Angeles, October 8th to October 13th.

Santa Barbara Fair, at Santa Barbara, October 10th to 12th.

Santa Cruz Fair, at Santa Cruz, October 10th to October 14th.

Tulare Valley Fair, at Visalia, October 17th to October 21st.

Mining Share Markets.

The mining stock market has been dull this week. The leading mines show no changes of moment, so whatever fluctuations there have been in stocks were not occasioned by any new developments in the mines. The outlook, however, throughout the whole extent of the Comstock is now thought to be more favorable than it has been in many months. In the Union Consolidated, the south drift on the 3000 level has passed through a series of streaks of quartz, some of which contained good ore, but not enough to bring the whole up to the paying point. These streaks, now crossed by the drift, were making toward the southwest, as though to join the seven-foot ore streak lying on the west side of the drift. At the Hale and Norcross they are fast nearing their 2700 level, at which point a station will be made and crosscutting commenced. As the ranchmen of Carson valley have agreed to turn all the water back into the river at the end of two weeks, it is thought the mills may then start up. Once the mills start, operations may be resumed in the Gold Hill mines.

Bullion Shipments.

Horn Silver, Sept. 4th, $24,000; Vienna, 4th, $9,500; Hanauer, 4th, $16,000: Stormont, 4th, $2,800; Hanauer, 6th, $3,340; Crescent, 6th, $7,410; Bullionville, 6th, $6,236; Ontario, 6th, $11,591; Horn Silver, 6th, $12,000; Alice, 7th, $11,116; Lexington, 7th, $112,150; Moulton, 7th, $7,500; Ontario, 7th, $4,451; Horn Silver, 7th, $18,000; Ontario, 8th, $4,232; Hanauer, 8th, $6,400; Cresent, 8th, $7,370; Hanauer, 11th, $5,300; Alhambra, 1st, $2,847; Mt. Diablo, 3d, $13,243; Christy, 1st, $3,572; Syndicate, 6th, $9,623; Contention, 8th, $19,204. During the week ending September 8th, there were shipped from Salt Lake 51 cars of bullion, 1,272,635 pounds, sent East; 39 cars of ore, 242,400 pounds, sent to St. Louis; 15 cars of ore, 459,860 pounds, sent to California, and 1 car of white lead, 22,000 pounds, sent West, making a grand total of 106 cars, aggregating 2,596,895 pounds.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

MIDDLE BAR TUNNEL.—*Ledger*, Sept. 8: The people of Amador do not realize the vast scope of this undertaking. The prevalent idea is that it is simply for the purpose of operating the Hamilton and Mammoth mines, which lie immediately north. This is one of the objects, but not the most important one. The stockholders in the tunnel are also shareholders in the two mines named. After running 1000 ft, the big bore is expected to strike the ledge on the Hamilton ground at a depth of 800 ft, and when it reaches the Mammoth shaft another 1000 ft beyond, it will be over 900 ft from the surface. The advantage of a tunnel outlet at such a depth, for draining and extracting ore, cannot be overestimated. But this object would hardly justify the construction of a large and heavily equipped tunnel, at an expense of $100,000. The enterprise has a far wider scope. It is no: intended that the tunnel shall stop when it reaches the limit of the Mammoth ground. Before that an arrangement will be made with the owners of all claims along the main belt clear through to Jackson, by which the tunnel owners will acquire certain guaranteed rights in the event of their claims being operated by means of this tunnel. It would tap the Zeile mine at a depth of 1300 ft, and the cost of transportation and crushing would be reduced to a minimum. The resources of the region between Jackson and the Mokelumne are comparatively untouched. The surface has been merely scratched over. Except at the Zeile, not a shaft has reached anything like a depth of 400 or 500 ft. But the magnificent developments of the Mammoth mine warrant the conclusion that this unexplored country is destined to be the banner district, not only of Amador, but of the main quartz lode of California. By means of this projected tunnel $4 or $5 rock can be worked at a profit.

NOTES.—The Mahoney Co. have notified the judgment creditors that they will no longer look after the property. The creditors have accordingly placed parties in charge. A contract has been let to run 100 ft further in the tunnel on the Doyle claim. James Morgan will resume work on both his claims forthwith. Only a partial clean-up of the Oneida mill on rock from the Jackson mine has been made. A thorough clean-up will be made in a few days. A strike was made in the Doyle claim this week, which promises to be of importance. The ledge is 15 ft wide, and full of sulphurets. The sulphurets are of a light color, resembling those met with at the Zeile.

Calaveras.

WEST POINT.—Cor. *Chronicle*, Sept. 8: The Bowlder Ranch gravel claim, on the Amador side of the Mokelumne river, have completed their tunnel to the bed of gravel, where they have struck a good prospect. In the Star of the West, Mr. Richardson, the superintendent, informs me that they have struck another body of galena which is exceedingly rich. On the Scorpion work continues and the prospects are encouraging. They are sinking a new shaft and have already struck on the ledge, which prospects fine and is 6 ft wide. In the Champion, Haskins & Hadler keep digging away, their prospects, at present not being very encouraging. On the Valentine the machinery is all up and ready for work. The Sterling mine is now running in full blast. They have 3-ft ledge and good paying ore.

COOK AND SCHWOERER.—*Citizen*, Sept. 8: The recent discovery by Cook and Schwoerer was not penned as a sensational item. The ore which they transport to town, is sufficient evidence. Richard Spence is also the happy finder of gold-bearing quartz the lead being about 10 inches in width. Both the above discoveries were made during the month in the vicinity of Indian creek. This section has been celebrated for gold-bearing lodes. The once famous claim known as the old Wood mine yielded a handsome amount but being of a pocket formation was shortly worked out. The Potter, Wallace and Pfeiffer, Al. Henry, Caruthus and the Old Calaveras are all included and located in this section.

Fresno.

MOUNT RAYMOND.—Mariposa *Herald*, Sept. 7: We are informed that Messrs. George Hearst, Sam Curtis, and San Pedro, the gentlemen who visited Mt. Raymond district last week, bought three mines—The Harlow, Van, and one other—for the sum of $30,000, and that $4,000 in cash was paid on the 29th of August to bind the bargain. All tests of the rock heretofore have been made with the view to smelting, but the gentlemen named took a quantity to San Francisco to try its milling qualities, and if the result is satisfactory, operations upon a large scale will be commenced. All the miners who have visited this district, agree that it will prove to be a big bonanza or nothing.

Nevada.

FLEMING.—*Transcript*, Sept. 8: Owing to the death of the Secretary and one of the Directors, and to the absence of the President in Mexico, Capt. James D. Fleming as a stockholder calls a meeting of the Nevada County M. Co. A recent clean-up at the mine proved highly satisfactory, and the chute now being opened will from appearances pay between $25 and $30 a ton.

NEVADA CITY MINE.—Everything is lovely at this mine. They have just completed the job of lowering a 10-inch pump from the 450 to the 600 level. The mine is looking better and more men are employed than ever before. The Nevada City is a big mine.

Plumas.

BLOUGH & HARVEY.—Quincy *National* Sept. 8: Mr. Jonh Hardgrave, of Taylorville, gave us a call on Saturday, and brought a box of specimens from the new strike in the Blough & Harvey mine. The tunnel to the Lucky S No. 2 has reached the ledge, and developed a four foot vein which prospects better than anything heretofore discovered there. The rock is rich, and the owners are highly pleased with their prospects. They have decided not to put up machinery before next spring, but will continue the work of development and take out quartz in quantities sufficient to warrant the expenditure necessary to put up first-class machinery at that time.

San Bernardino.

GOLCONDA.—"We have taken a stroll through the mines," says the editor of the *Print*. Of Mrs. Townsend's mine, the Golconda, he speaks as follows: "Mrs. Townsend sent one ton of first-class ore to Jerome Fargo, of San Francisco, to have it tested. It was divided into four equal lots and taken to four different mills, and resulted in an average of $900 per ton. The ore was taken from the line of the Golconda and Alhambra, and partly from each claim. The ore is divided into three grades, the first averaging, according to assays, $2,000 to the ton and the second $200. The owners of the Golconda are Mrs. A. K. Townsend, who owns one-half interest, J. H. Cook, one-third interest, and A. M. Rikert, (nephew to Commodore Vanderbilt,) one-sixth interest. Considering the amount of work done on this claim it presents a finer showing than any other in that neighborhood. It has a good ledge to follow and shows considerable evidence of permanency. While enjoying the hospitality of Mrs. Townsend in her neat and comfortable cabin in Deep canyon, where she lives with her father and little daughter, we were shown an ore sack full of beautiful specimens from the Golconda, some of which contained bright particles of wire silver. Mrs. Townsend carefully assorts all her own ore and has become quite a practical expert in mining business."

Sierra.

GIBSONVILLE.—Downieville *Tribune* Sept. 6: In the Tabor mine the company are raising a shaft 200 ft; 140 ft of it is completed. W. S. Chapman, a San Francisco capitalist, is interested with Mr. Tabor. The company have a tunnel in 2300 ft through hard rock. The rock is getting softer. The people here are anxiously awaiting the development of this property. Mr. Tabor has already expended over $30,000 of his own money in prospecting the mine.

POKER FLAT.—Mr. Linsey, of Howland Flat, is prospecting a quartz ledge near town. The ledge is well defined, and fine specimens have been found.

NOTES.—The Nebraska Co., at Howland Flat, have let a contract to run 400 ft of tunnel. The Bonanza Co. are increasing their working force. The Gibraltar M. Co. have let a contract to John Schramm and Fred Drimpin to run 200 ft of tunnel. The Sunnyside Co. are pushing work and expect to strike gravel in a short time. Some rich claims have been worked in the vicinity of Sunnyside.

MARGUERITE MINE.—Supt. Shaw took his departure for Boston last week, leaving President Humbert in charge of affairs. * * * *

Later.—Since setting up the foregoing, work at the Marguerite has been suspended. It is stated that the company owe $10,000 in this county. There is something mysterious in the manner in which the affairs of this company have been conducted. It is well known that the mine has yielded handsomely. We trust that the Boston manipulators will return a little of the mine's production, enough to pay off the debts and open up the mine as it should be.

BRANDY CITY.—A portion of the machinery to be used at the Brandy City mine arrived last Thursday. The company have already run 216 ft of their new tunnel by hand. They now have an open cut of 200 or 300 ft to run, after which they will commence work with the Burleigh drills. It will take at least 2 years to complete this enterprise, at an estimated cost of $100,000.

TABLE ROCK.—The Table Rock M. Co., whose property is near Howland Flat, are pushing ahead their main tunnel. The tunnel is now in 2600 ft, and recently soft rock has been encountered. There are 10 men employed.

BALD MOUNTAIN.—The Bald Mountain Extension Co. cleaned up 150 ounces of gold Sunday out of the South Fork mine at Forest City.

NEVADA.

Washoe District.

SOLID SILVER.—*Enterprise*, Sept. 8: Thomas Crowley, late of Como, has been appointed superintendent, and commenced work on the first inst. As yet but one shift is employed, but as soon as the tunnel is repaired work will be pushed with three. At several points the tunnel cut rich feeders, and the largest of these will be followed.

GOULD AND CURRY.—East crosscut No. 2, on the 2300 level, was extended 263 ft, when the diamond drill was put in and run out a further distance of 134 ft, all the way in hard porphyry. The drift passed through a vein of fine-looking quartz, which shows a width of 130 ft between clays.

UNION CON.—The south drift on the 3000 level has passed through a series of stringers of quartz. It is now out about 60 ft, and the face is in vein porphyry. The joint Sierra Nevada winze, below the 3000 level, is down 55 ft.

OPHIR.—West crosscuts Nos. 1 and 2 on the 150 level are making good headway. They have passed through some old drifts not found on the maps.

MEXICAN.—The upraise from the 2900 level is fast draining the winze down from the 2700 level. The ground is still hard and the men are discommoded by the water which streams down upon them. Good headway is being made in the main north drift on the 3100 level.

ALTA.—The water had yesterday been lowered to a point 40 ft below the 1300 level by the tanks. The rod was connected and the pumps at the 1300 started last night.

SIERRA NEVADA.—The main north drift on the 2900 level is pushed ahead rapidly. It will open up to exploration a large area of very interesting ground.

BEST AND BELCHER.—The north drift on the 2500 level is slowly draining out. Work will be resumed in it when the flow has sufficiently decreased.

YELLOW JACKET.—The only work being done below the surface is on the Sagebrush level, from which point some ore is being extracted.

HALE AND NORCROSS.—The winze below the 2600 level still carries streaks of ore at the bottom. The winze is nearing the 2700 level, at which point a station will be opened and crosscuts made.

NORTH GOULD AND CURRY.—Work was resumed in the shaft last Thursday with two shifts of miners.

IMPERIAL.—The work of putting in order the hoisting machinery progresses well.

BELCHER.—The ore dumps are full, and awaiting the starting up of the mills on the Carson river.

SCORPION.—The west crosscut on the 500 level is passing through ground that shows occasional streaks of clay and quartz.

ANDES.—Both the west drift and the winze are in hard quartz. This quartz is metal-bearing.

CROWN POINT. Active mining will be resumed as soon as the river mills can reduce the ore.

UTAH.—Good headway is making in the main north drift on the 1300 level. The drift is cutting some streaks of quartz.

SAVAGE.—Work will soon be resumed in the drift on the 2600 level, where there is much unexplored ground.

CHOLLAR. Prospecting will not be resumed until the new hydraulic pump goes into operation.

UNION SHAFT.—The work of easing timbers at the 2300 station will soon be completed.

CALIFORNIA.—Are making the usual progress.

CON. VIRGINIA. The usual progress is being made in all underground work.

Candelaria District.

NORTHERN BELLE. *True Fissure*, Sept. 8: The crosscut from the southwest drift on the fifth shaft level has been extended 9 ft. The face is still showing sulphurets. The crosscut to the south has been advanced 12 ft into soft slate, showing some barren white quartz. There is an improvement in the stope from the fourth shaft level, both in quantity and quality. The stope from the upraise from the fourth shaft level is again yielding a small quantity of ore, and looks promising. On the General Thomas location, in running a tunnel from the surface, quite an important development has been made. A vein of ore, 3 ft in width, has been uncovered, giving every indication of permanence. Everything is running smoothly at the hoisting works. Both mills are running as usual. The total bullion shipments for August amounted to $27,946.57.

MOUNT DIABLO.—The stope from lower winze No. 2 is giving considerable $50 ore, and the ledge shows some improvement in the east end. There are several places below the third level, near winze No. 1, that are turning out considerable ore of fair grade. The stope above the west drift from the Callison winze shows some improvement. In the eastern end the ledge is wider, and of better grade. A shipment of bullion was made on August 30th of $5,237.04, and one September 3d of $8,006.98, making the total for August account $64,915.50.

COLUMBUS CON.—During the past week the work has made rapid progress in the shape of drifting from the shaft to the old workings. It will take about twenty days to make this connection, and until it is made no work will be done towards the extraction of ore.

Esmeralda District.

MOUNT CORY WORKS.—Hawthorne *Herald*, Sept. 8: Work at the Mount Cory Reduction Works is fast nearing completion. The mason and carpenter work is nearly finished, and most of the machinery and iron will be on the ground in a few days. The return of Supt. McKenzie lends new impetus to the work, and the people of this section will no doubt soon have an opportunity of seeing one of the largest and most complete reduction works on the Pacific coast.

Eureka District.

EUREKA CON. *Sentinel* Sept. 6: The water in the Eureka Con. new shaft stands at a height of 60 ft from the bottom. The machinery keeps it at this point without difficulty. Supt. Read is convinced that the flood comes from a reservoir which is being gradually emptied, for if the water came in by a current it would have been pumped out before this time. He says he has not the least doubt but the water will all be removed in time.

STAR DISTRICT.—Allen G. Campbell made a large purchase of mining interests in Star District last week. The purchase comprises the interest of P. Kemple in the following named mines: Kanarrah, Mountaineer, Clean Sweep, Wasco, Quebec, Wasco No. 2, Vulcan, Reindeer, and Conomongh. The price paid was nominally designated as $8,000.

LEACHING OR MILL PROCESS.—W. F. Leon and D. J. Jaekson, are visiting Eureka. They will investigate the process of reducing ores at the Geddes & Bertrand mill, with reference to leaching the ores from the Belmont mine. Mr. Fassett, the superintendent, recently tried 10 tons of the ore in the company's mill and 10 tons by leaching. By the latter process the ore was worked up to 95 per cent and by the former up to only 67 per cent; while the cost of reduction by leaching was, of course, considerably less than by mill process.

MARTIN WHITE.—The late report from the superintendent says: Although small, this is the best find of ore that we ever had on this level, in my estimation, as it is directly under the best ore bodies of the upper levels, and it will probably connect with them. The Secretary's report shows that there is $33,513.30 worth of supplies on hand and ore extracted valued at $44,182.30.

PARADISE.—J. V. McCurdy shipped yesterday from the Paradise Valley mill one bar of bullion, valued at $1,725.

HARRIS MINE.—Reno *State Journal*, Sept. 1: Some developments have been recently made in the Harris mine, in the mountain back of Washoe City. Within the last day or two the ledge has widened from 20 inches to 4 ft. Instead of the base ore heretofore found, there is an entirely new character of quartz. It literally sparkles with gold.

EUREKA TUNNEL CO.—*Sentinel*, Sept. 8: The semi-annual report says: The ore extracted from the mine for the six months ending Aug. 31 amounts to 1,425½ tons, of an average assay value of $63.87, giving us a net product at furnace of $52,113.99, approximating $36.57 per ton. The bulk of this was taken from the hard vein forming what is known as the Addison chamber and called chloride ore. The exploration of the mine to a depth of 150 ft below the tunnel level proves the continuity of the ore body first found in the south drift from the main tunnel.

Tuscarora District.

ARGENTA.—*Times-Review*, Sept. 6: North crosscut, 400 level, is in 73 ft; progress for the week, 16 ft.

ELKO CON.—Shaft No. 2 extended 11 feet. Total depth 112 feet.

GRAND PRIZE.—West drift north lateral vein, 300 level, extended 23 ft. South drift 300 level is in 66 feet; progress, 13 ft. North crosscut, 400 level, extended 15 ft.

NORTH BELLE ISLE.—Good progress has been made in extending the drift south on the 300 level. Have commenced stoping ore on the 70 level. The stopes show a high grade ore.

INDEPENDENCE.—Total length of drift north on the 300 level, 753 feet; progress during the past week 21 ft. North on the 400 level 30 sets of timbers have been replaced.

BELLE ISLE.—North on the 450 level the drift has been extended thirteen ft; total length, 244 ft. No. 1 drift north on the 350 level has been advanced 18 ft.

NAVAJO.—Drift south on the east lateral vein, 350 level, has been extended 8 ft; total length, 508 feet. The connections between the 450 and 350 have been completed, and from the south drift on the 450 level a crosscut has been started west. Station at the 650 level will soon be ready to receive the new pumps.

INDEPENDENCE.—*Times-Review*, Sept. 7: The Supt.'s annual report says: During the past year we have extracted and milled 267 17-20 tons of ore, averaging $322.88 per ton. The Navajo Mining Co., having the mill in use, milled our ore for us at the rate of $25 per ton, net cost, and worked it to 93 per cent of the battery assay. We received and shipped to the Anglo Bank of California bullion to the amount of $62,910.45, and after deducting bullion discount on the balance of the bullion, and paying for the milling of the ore, we received from the Navajo Co. in coin, $8,472.07. The ore seam averaged very small, but the grade of ore ran unusually high. This ore was extracted above the 300 level, and considerable work has been done in the same locality without discovering any more ore. The prospects are very flattering for good results, when crosscuts are extended from the drifts now being driven north and south on the 300 and 400 levels.

ARIZONA.

MCMILLAN.—Globe *Chronicle*, Aug. 25: The mill is running night and day. There are from 15 to 20 men employed about the mine. We understand there has been quite a ripple of excitement at Moor's camp, caused by the late rich strike in the Imperial mine. This mine is on a line with the Stonewall.

MINERAL PARK.—*Alta Arizona*, Aug. 25: A rich strike is reported in the Burke mine in Music mountains. The proprietors, Welton & Grounds, have 5 men working and expect to increase the force. They are taking out $200 rock and hauling it to Hackberry to ship to Argo, Colorado. After a run of less than three weeks the Mineral Park mill has made a clean-up. The best ore worked this run was from La Porte's mine, near the Ithica. It is a free milling chloride ore and sampled over $500 per ton.

NOTES.—Prescott *Courier*, Aug. 29: Mr. Murry, of the Verde M.'Co., Black Hills, is in town and tells us that the smelter continues to do good work. The shipments to and from the smelter average 500 tons a month. The Groom creek mill and concentrator are working ore from the King Kelly mine. Hathaway tells us that 16,000 pounds of bullion were, Saturday, sent to the railroad from the Howell reduction works. Mr. Dawes' friend, at Tip Top, says that sinking on the 900 level is going on day and night. Alter & Co.'s Catocton ledge has between 5 and 6 ft of quartz, 20 inches of which assays hundreds of dollars per ton in silver. The Dosoris mine continues to yield the richest kind of silver ore. W. B. Murry, of the United Verde Co., says that in one day's run with a 30-ton smelter, 16,000 pounds of black copper, assaying 97 per cent, and two tons of copper matte, 75 per cent stuff were run out. Better still, the silver, 540 ounces in every ton of copper, made the day's run worth about $7,000.

HUACHUCA.—Tombstone *Epitaph*, Sept 2: Pat. Bracken, of the Lena mine in Cornell district, Montezuma canyon, is delighted with the outlook of Cornell. The Lena mine is being actively worked, and has an open cut of 50 ft, showing a well defined ledge of galena. With a force of 8 men they are now shipping 40 tons of paying ore to the Charleston smelter.

CARLISLE.—Mr. E. B. Gage brought back with him samples of ore from the Carlisle mine, from the bottom of the 180-ft shaft, which he had assayed. The result was: silver, $694.53; gold, $369.57; total $1,064.10. This mine is now considered one of the richest in the country.

THE FAMR MINE.—*Silver Belt*, Aug. 25: There are 70 tons on the dump which will average $250 per ton, and a satisfactory showing of ore in sight, in the mine. Ten men are at work.

PIONEER.—The South Pioneer mine is taking out lots of rich ore on the different levels. The Howard M. Co.'s 10-stamp mill has been running a couple of months, and its run has not been excelled in the district, having turned out over $60,000 worth of bullion. The Pioneer 5-stamp mill is badly in need of water,

NOTES.—Pinal *Drill*, Sept. 1: At the King all the damage by the storm has been repaired and all goes on as usual. On the Mount View they are drifting and are obtaining very fine ore. They work three shifts. The Speciepaying is sinking for water for their mill. They are down 70 ft and have found water, but not in sufficient quanity. At the Surpriser, ten miners are working accumulating ore. The mine will be thoroughly developed before starting the mill again. The Frankfort is west adjoining Monareh of the Sea. They are sinking a shaft and are down 40 ft. They are in ore, similar to the Silver King. Syenite carrying zinc blend and averaging $40 per ton silver. The Monarch of the Sea, adjoining, is again at work.

COLORADO.

TELEPHONE.—Georgetown *Miner*, Sept. 1: On Saturday 3,200 pounds of Telephone ore, milled at the Pelican works, netted $635.66, the first-class going 677 ounces, the second-class 253 ounces and 35 per cent lead. The product of the mine for 27 days with two men working was $1,280. Part of this time was spent in drifting.

CORRY CITY.—The 90-ft shaft has been pumped out and drifting started east and west. There is a 14-inch pay-streak, which assays from 49 to 63 ounces. On the tunnel level a stope is being raised over the shaft. A 12-inch streak of ore was uncovered for 20 ft, assaying 280 ounces. An average sample from the tunnel level drift ran 250 ounces.

READY CASH.—J. M. Wilson called Monday with half a dozen specimens from this mine at Williams Forks, La Plata district. They were literally spattered all through with native silver. The specimens came from a point 170 ft in the adit tunnel. The ore in the raise will average four inches all the way. Pieces weighing 300 and 400 pounds are shot down, all carrying the same kind of ore. There is a 400 pound specimen on the dump now.

MONTEZUMA.—The Sisapo sampling works shipped 77 tons of ore last month, and 200 tons the first 24 days in August.

VULCAN.—A recent run of three tons from the Vulcan mine gave 271 ounces per ton.

SNOW DRIFT.—One hundred sacks from the Snow Drift, Republican mountain, second-class, shipped Saturday, ran 108 ounces silver per ton. The last shipment of first-class went 535.

SEVEN-THIRTY.—This mine, owned by H. M. Griffin, is employing 40 men. The levels being run are the 240 ft east and west, the 310-ft east and west, and the 375 ft west. All show mineral. A lot from the 240 level ran 706 and 257 ounces silver per ton. Another lot from the same level on the 18th inst., brought 638, 235 and 104 ounces silver per ton.

LEGAL TENDER.—Denver *Tribune*, Aug. 29: Professor Stearns, of Washburn college, Topeka, thinks that this has as promising a future as any mine in the State. Five assays were made from ore from five different portions of the shaft, and averaged $102.42 silver, $4.13 gold and $1.50 lead. The lowest run ever made was $31.93 silver to the ton, the highest assay being $1,086.03. The ore is the sulphide and chloride of silver, sulphide and carbonate of lead, from 12 to 13 per cent, silica, from 7 to 10 per cent. of iron and a very small percentage of manganese and zinc. The most remarkable feature of the mine is the immense quantity of ore in such easy shape for mining.

ALICE HYDRAULIC.—*Courier*, Aug. 30: The yellow dirt overlying the talc will wash an inch string of gold to the pan. The ground washed at present is known to be much richer than any heretofore washed. Considerable native silver is found in the sluices, one chunk as large as a hen's egg being found a short time since.

INVINCIBLE.—Idaho Springs *News*, Aug. 24: From Mr. John Owen we learn that on Tuesday a one-half interest in the Invincible mine was sold, the consideration being $25,000. This property has come to the front within the last two years, and now bids fair to become one of our big mines.

NOTES.—A carload of assorted ore from the Little Mattie shipped to Black Hawk this week netted $2,000. A carload of ore of 11 tons, shipped last week from the Albro, netted $76 per ton. The Queen lode on Seaton mountain is worked by lease. The result of six men working 25 days, drifting and stoping, was nine tons of ore shipped on the 20th inst., netting $1,450. The Rio Grande lode in Spring gulch, is owned by Jones, Camp and McMann. Developed by shaft 100 ft; 4 men working one shift sinking shaft; 10 inches of solid ore in bottom of shaft, two specimen assays of which ran $106 and $70 gold and silver.

IDAHO.

ATLANTA.—Wood River *Times*, Aug. 29: At Atlanta Hill, sucessive discoveries have proved the existence of a mineral belt extending five miles from north to south, and four miles from east to west. The veins with the exception of the Atlanta, the mother lode, all have a general southeasterly and northwesterly course. These "feeders" are of enormous width; the Tahoma has an average width of 35 feet; the Leonora, 15 ft of ore, and an equal width of ledge matter; the Magnet 30 ft; the Alaska the same; the Last Chance (or Atlanta Hill) 60 ft. Although discovered 20 years ago, small quantity of work has been done. The greatest depth attained is in the Monarch (or Atlanta), about 400 feet. As it costs $80 a ton to realize on ore, none assaying less than $100 could he worked; many thousands of tons of ore assaying less than $100 are therefore awaiting less expensive modes of reduction. Better times are at hand. The Atlanta has a regular Comstock three-compartment shaft, with drifts or levels opened at every 100 ft, and running to the ledge, where straight drifts are run both ways, with crosscuts to the walls at regular distances. Col. Pettit, who is in charge, has cut the three ore chimneys on all the levels from surface to the 400, and it is estimated that there is over $2,000,000 of ore in sight. It is thought by competent judges to be likely to prove a second Comstock.

THE BACKBONE.—The camp of Bullion—the "Backbone" of Wood River—is experiencing a reawakening. During the past few weeks the force at work has been greatly increased, and there is not an idle man willing to work in Bullion to-day. The Wood River Mining Co., which owns the Bullion-Ophir group, has 100 men at work; the Mayflower, Jay Gould, O. K., Eureka, and other companies must be employing between 300 and 400 more. Then the production of the camp will probably amount to 30 tons per day, as follows: Wood River Co., 10 tons; Mayflower, 5 tons; Jay Gould 5 tons; Idahoan, 10 tons. This besides the first-class ore, the yield of which will amount to 25 tons per day.

RUTH AND HEATH DISTRICT.—This district is on Snake river, 70 miles north of Weiser city, 30 north of Olds' Ferry, and 275 from Hailey. Very little work has been done there, but on one claim—the Greenhorn. Mr. Ruth has showed up an 8 ft face of ore, some of which goes as high as $4,500 per ton, and the whole of which will average $900. Mr. Ruth has a two-stamp mill about 1½ miles from the mine, and he works alone, doing the mining, packing on his own animals, milling and cooking himself.

SHEEP MOUNTAIN.—*World*, Aug. 28: Myron Crafts, assayer for the Custer Co., was in Sheep Mountain district a short time ago to make arrangements for putting up a smelter at the Mountain King mine. It will be packed into Sheep Mountain and put up as soon as possible. Nick Johnson's train of thirty-five animals was loaded three times this summer with Mountain King ore, which was smelted at Bay Horse. The cost of packing was $60 per ton; smelting $40, and the owners of the mine received $45 after paying all expenses, so the ore ran $145 per ton.

LEONORA.—*World*, Aug. 31: Hon. Jas. White informs us that the frame-work for the Leonora mill was up when he left Atlanta, and part of the machinery was on the ground. The mill is a ten-stamp. The Leonora is half-way between the town of Atlanta and the Atlanta mine. There is a very large body of it that pays to mill. George Timms' mine, north of the Atlanta, is turning out good rock. A crushing will be made in the Buffalo mill this fall. The Last Chance, between the Atlanta and Buffalo is a good mine. The ledge carries gold, and the ore is free-milling.

QUEEN OF THE MOUNTAINS.—Ketchum *Keystone*, Sept. 1: The Queen of the Mountains mine, on Warm Spring creek, has been leased to Reiff and Montgomery for one year, and these gentlemen are about to put on a crew to work the mine for ore. They have also purchased a one-fourth interest in the same.

MONTANA.

ANACONDA.—Cor. of *Miner*, Aug. 25: Since my last the "Swansea of Montana" has made rapid strides. There are now over one hundred buildings in the town and a safe estimate places the population at five hundred. The Anaconda Co. are pushing work on the smelter, upon which two hundred men are employed, in running the tunnel for the mill race, building arches for the calcining furnaces, laying the foundation walls, grading for the concentrator and lining the ditch with lumber.

MAIDEN DISTRICT.—The Ore Cache Co. has, in connection with its mine a substantial mill with a capacity of 10 stamps. In twenty-five days this has turned out 400 ounces of retort, valued at $17 per ounce. By the first of Sept. a new 20 stamp mill will be completed. Custom ores will be worked. Ten concentrators will be at work. The ore in the Collar is silver bearing. Work is being done on the 150 shaft. At 70 feet a level of 40 ft to the northeast has been run. In neither level has the northeast wall been found, which shows an immense lead.

PONY.—Cor. Butte *Miner*, Sept. 1: The Willow Creek, which is developed by tunnels on the ledge to a depth of nearly 200 ft, has an ore body from 12 to 15 ft in width, averaging $24 per ton, with almost 700 tons of quartz on the dump. The upper half of the Ned has two tunnels on the lode, the lower one 200 ft in depth and its face producing from a 2½-ft vein ore averaging $35 per ton, of which there is several hundred tons on the dump. The White Pine has a 2-ft vein of $45 ore, and is developed by shaft and levels to a depth of 200 ft. The 500 ton dump pile is rapidly disappearing through the 10-stamp mill of Thomas Carmin. The Boss Tweed, with its 30-ft body of fair concentrating ore, is locked in the close embrace of six or seven separate owners, who won't do this and who won't do that. The most of the property is owned by Henry Elling, who is erecting a 20-stamp mill, with Blake crushers, etc., the whole to be run by a Leffel turbine. The mill will be ready for crushing about the first of October. The Potosi mines, 10 miles from here, are being represented by their owners. The mines assay well, but their owners generally have not the means to develop them to any great extent. Cummings & Williams are erecting a five stamp mill in Hot Spring district. Norwegian gulch is being successfully worked by a flume—Wilson & Co.'s.

SUMMIT VALLEY.—Butte *Miner*, Aug. 29: The bullion shipments for the week amounted to $78,864, credited as follows: Alice, $23,680, Lexington, $35,408 and Moulton $19,770. The consignments of matte and copper-silver ore at the U. and N. freight office aggregated 870 carloads, 340 of which were copper matte and 530 ore. The principal obstacles to development in the Summit Valley district are the high prices set upon mere prospects by excited holders, which drives investors to other districts, and the lack of custom mills, sampling works or a market for our ores. There are in the district upwards of 200 mines, which are more or less developed and which the owners believe would pay large profits if facilities for reduction were at hand. At the Moulton work is vigorously prosecuted in the west workings and the stopes are looking better than ever. The winze from the 300 southwest drift is down 70 ft and in a 3 ft ledge of 40 to 50 ounce ore. At the Alice no special developments have been made during the week. Work is prosecuted with activity, and the usual amount of ore extracted from the Alice and Magna Charta. The west drift from the 800 has advanced 105 ft, the ledge maintaining its width, grade and uniform character.

NEW MEXICO.

KEYSTONE.—Kingston *Tribune*, Aug. 30: The Keystone mine, South Percha, owned by George Webber, is down 20 ft in depth. The crevice is 5 ft in width, with mineral all through the gangue rock, some of it assaying high in silver.

BULLION.—The Bullion Co. is shipping its 15th carload of high grade ore. The net returns so far amounted to $50,000. The average value is, therefore, over $3,000 per carload. In addition, there is a large dump of lower grade ore which will be concentrated as soon as the new machinery arrives. Fifteen thousand dollars has already been paid in dividends from a mine which cost but $10,000 about one year ago.

NOTES.—A large body of 41-ounce ore has been struck in the Ivanhoe mine. The shaft of the Black Prince at Bullard's Peak, has attained a depth of 46 ft with high grade ore the entire depth. A ledge of ore 9 ft wide that averages 700 ounces of silver was recently discovered west of Silver City. A carload of ore from the mines of the Solid Silver Co., at Bullard's Peak, Golden, Col., netted between $7,000 to $8,000. By legal appointment, the Columbia mine at Lake Valley was sold last Saturday to the Sierra Bella M. Co. for $30,500.25. The title has rested one-third in Hon. John A. Miller, and two-thirds in the Sierra Bella Co. It is a subject for congratulation that their quarrels are now ended.

SILVER CITY NOTES.—*Southwest Sentinel*, Aug. 25: Dane & Berg have the contract for the erection of the Deming smelter. It is to be 30 by 60 ft, and have a capacity for 30 tons per day. The machinery arrived a few days ago, and the work of putting up the building is going rapidly forward. The Tres Hermanos district, in Grant county, is coming to the front. Since the Deming smelter has become an established fact, claim owners in that district have gone to work with a will. The main shaft of the Old Man mine is down 60 ft, and a drift has been commenced to meet the tunnel. The entire level is in solid ore, and as soon as the drift and tunnel are joined, the company will commence sinking deeper. The force is being increased as fast as room can be made.

Examination of the Carson Footprints.

(CONTINUED FROM LAST WEEK.)

Footprints of the Deer.

I use the term provisionally; they may belong to the peccary. Close under the cliff, near the series No. 1, we found a line of tracks made by an animal with a sharp pointed, broad heeled hoof. Whether this was a cloven hoof, we could not decide, because the impressions were made in quite soft mud into which the foot of the animal must have sunk two or more inches, and when retracted each hole was in a great measure closed. The best two prints give the length of the impression 2½ inches, and the breadth of the heel 2 inches.

We measured the relations of 10 of them and found the average straddle was 8 inches, and the average longitudinal distance apart of the consecutive imprints of the 5 of the left feet is 2 feet 9 inches; and of the right feet is 2 feet 7 inches. But the range of these distances is 7 inches, and of the straddle over 4 inches. The pathway was not straight, nor was the mud quite uniform in stiffness. The footprints of each side indicate that each hind foot exactly, or very nearly, covered each corresponding forefoot.

Footprints of a Large Bird.

Of the numerous prints of a four-toed bird we selected four for measurement because the line was nearly straight and the distance nearly even. Other imprints were even more distinctly marked near one of the large quadruped imprints which Mr. Gibbes has referred to in his first description as "several confused tracks of a man and some large animal" (page 2), but these latter bird tracks were in a short curved path and the pace irregular.

In those measured the step or pace was twenty and one half inches, the length of the middle toe four and one half inches, of the two side toes from tip to tip seven and one half inches, and of the hind and thinner toe two and one fourth inches. In this track the hind toe was pointing inward, both for the left and right foot.

The wader which made these tracks would be that of a good sized heron or crane.

Footprints of the Tiger.

I use this term provisionally. On the lower floor are several lines of tracks, some of which are very obscure as to details of structure, but apparently made by a four-clawed animal. Our limited time forbade us examining all of these lines minutely, but we traced four pairs of double tracks of another animal, which we have provisionally designated a tiger, and of which I present a drawing. The animal was bounding from the line of the cliff towards the N. N. W., and unfortunately the surface of the stratum impressed has been badly scarred by rocks tumbled upon it in quarrying. The first pair of tracks is obscure; the next three pairs very well marked, the marks of the nails in the extended claws being clearly impressed, and the toe-pads also. On the same horizon are the tracks of the same species of bird as already described, and also the faint impress of the so-called man. These latter are fairly well outlined by the fact that there has undergone, in the compressed clay or mud, a certain oxidation of iron which gives its red color to the imprint. But one of these latter footprints is certainly duplicated at the heel as if one foot had stepped nearly in the track of another, and at the outer tiger tracks it seems, from the impression, that these were made after the impress of this so-called man track.

I judge by the increased length of the successive strides, as well as by the extended claws, that the animal was bounding. Beyond the last pair of tracks the horizon is destroyed. There are tracks of an unknown animal a little to the right of the prolongation of these tracks; apparently it had four sharp pointed toes or claws. Beyond these indefinite ones occur two pairs of tracks which might be made by a wolf; of these Mr. Gibbes has taken casts.

The accompanying diagram is introduced to illustrate the general character and relative position of the tiger tracks, except as to direction, as the animal swerved somewhat to the left. The left feet impressions are larger than those of the right, and at the third pair, either the left foot slipped back or there was a duplication. I incline to the former explanation; and it will be noticed that in the alternate pairs the left foot is at a greater distance forward of the right foot, as 12 and 12 to 6 and 2 inches.

The average straddle is only 5 inches; the consecutive longitudinal distances between the left toe of each pair are respectively 4 feet 8 inches, 5 feet 6 inches, and 6 feet 6 inches. I have not drawn the imprints to scale, nor have I been accurate in details of structure, because casts will be made of them. The positions and sizes of the bird and so-called man tracks are only approximated in the drawing as of secondary importance in this relation.

Footprints of the Horse.

By removing some quarried rocks Mr. Bell exhibited a line of tracks which seemed to have been made by a horse, because the impress of two of the best of them showed satisfactorily the existence of the frog of the horse's foot. The depth of the first one had preserved it from injury in quarrying, etc., and at the bottom the length was five inches and the breadth four inches; at the surface the length was six inches. These imprints indicated to my eye that the foot was more like that of a mule than a horse; and as my party is constantly using both animals in our geodetic surveys we are somewhat familiar with the different footprints.

The average longitudinal distance apart of the imprints of the right side is five feet, two inches; of the left side five feet, three inches; and the breadth of the straddle is about four inches, but the line of travel is not straight. The accompanying diagram illustrates upon the same scale as the others the stride and size of the footprints of this animal.

Nearly parallel with this line of march are several other lines of apparently a similar animal, but the imprints are relatively obscure as to structural details. The general features, however, are similar.

Footprints of a Bos.

Provisionally we have referred to this animal as the "nondescript." Close under the eastern cliff there is seen the impresses of five feet. The animal was apparently a short stepper, had cloven hoofs, and a body so heavy that the feet sank deeply into the soft mud layer, probably to a harder layer below. It would appear that when the foot was withdrawn the mud was in such a plastic condition that it inflowed sufficiently to obliterate the bottom marking of the hoof. The surface of the layer is marked by heavy rain drops, and there are bird tracks near it.

There are only five of these footprints, when the animal turned to the left and the horizon is lost. The average longitudinal distauce apart of the left imprints is two feet two inches; and the average longitudinal distance of the consecutive footprints, one foot one inch; and the straddle six inches.

So far as measurements could be fairly made, the average length of the double hoof was three and three-fourths inches, and the breadth nearly three inches. Three of them were two and three-fourths inches broad at the heel, and two consecutive ones first before the animal turned were three and a half broad.

These imprints present somewhat the appearance of a heifer's tracks, and Capt. Hooper, of the U. S. Revenue Marine, who has had the experience of two seasons in the Arctic, says they immediately suggested the reindeer tracks to him, although the latter are broader.

A Fine Curved Line.

Near these imprints is a sharp, double looped curve cut in the soft mud. It is roughly indicated on the canvas from memory. It is a fine-cut line ranging from one-half to one millimeter across, and less than that deep. I removed some crystals from one part of it to test its having been made at the same time as the nondescript.

Footprints of the Dog

A line of tracks provisionally assumed to be those of a dog exhibit a peculiarity of gait, which is shown in the unfinished drawing, instead of progressing with apparently alternate steps, we see a progression by alternate pairs; *i. e.*, two steps rather close to each other or side of the line of march, then a wider space to similar tracks on the other side of the line of march.

The structural details are moderately good.

Another drawing of similar but larger footprints was made by Mr. Gibbes; it exhibits this peculiarity of gait still more markedly, for the prints of the close pairs are only 4½ inches apart, and the distance apart of the pairs is 14½ inches.

There were other footprints which we had not time to measure, but, which may prove of great interest; especially as two or more of them may possibly have been made by web-footed birds.

The Published Diagrams Should be Corrected.

A pressure of other duties has compelled me to be much briefer than the subject demands. I have endeavored to state the facts as they have appeared to my eye and to a steel tape line. I had no theory to advance in making the examination, but I could not help having convictions forced upon me which were made stronger with each new phase of the investigation. But in the first place I wish to call attention to the diagrams published under the auspices of the academy, and therefore making it responsible for the results. The work had been done with great conscientiousness, but there is nothing in the diagrams to indicate whether a footprint, especially of the so-called man, is obscure, or whether it is distinct and well marked, as in series No. 1. Now, as a matter of fact, these footprints on the lower floor are mainly very faint indications, and would most likely have left no outline from the removal of the upper and softer layer, but that there is a development of the red oxide of iron in what was the lower clay surface wherever the animal placed its feet.

Therefore, in so far as the diagram is concerned, these facts should be; as they can be, fairly and properly indicated by different depths of shading, etc.

Secondly, in the diagram of the mammoth footprints and other tracks at the southeast angle of excavation there are two matters that need rectification as misleading. First, the legend, "Impression of the Body of an Animal." Now, as a matter of fact, this is only a report that has been handed down in the history of the earlier excavations, for the floor is removed and nothing whatever is left to indicate this problematical "impression."

Thirdly, near the same place on the diagram are five round, full tracks described with others, in the text as "several confused tracks of a man and some large animal." This "large animal," referring to what made the round tracks; but these apparently different tracks were all made by the same animal, the so-called man. When this animal came to this part of the mud deposit it found itself in soft mud, into which the feet sank about four inches, apparently to hard, coarse sandstone beneath, and it possibly made a turn to avoid being bogged. One of these round tracks has had the center core of coarse sandstone removed by Mr. Bell, and the result is a display of one of the long footprints, and the others are certainly footprints of the same animal, produced at the same time, but these prints are yet all filled up. Whether this filling is from the supposed deposit of coarse sand, as in the one cleaned out, or whether from "balling" of the foot, remains to be proven. I have written to Mr. Bell, asking him to make an examination of the matter.

And here it may be suggested that in this very locality we might reasonably expect to find more important footprints and possible remains, especially if the animal became bogged in this soft mud.

The So-called Man is a Quadruped.

The question of the quadrupedal character of the footprints of the so-called man having been raised by high authority, it was a matter of interest to ascertain if there was any indication of duplication of footprints; that is, whether the hind foot was placed unsymmetrically over the back of the forefoot. I have already stated that in series No. 1 there are no two tracks which are exactly alike, and that in the line of the wolf's tracks one of the imprints of the foot of the so-called man is apparently duplicated. Other indications of duplication are to be found in the different series on the lower floor, and in more than one instance a secondary side impress on one side only of the animal is as clearly indicated as the impress itself. So marked was this in one instance that a plaster cast had been taken of the two, and I examined the original to find the smaller secondary clearly made out but the larger and inside track mostly obliterated by the wheels of carts carrying stone from the quarry.

In this light the evidence seems to me unanswerable that the so-called man was a quadruped, and it will require the wiping out of these duplications before they can be assigned to a biped.

The question of the assumed sandal of wood or of rawhide, was clearly solved in my mind as soon as I made out the existence of the two layers of mud of different stiffness and tenacity, already detailed with some minuteness in the description of the footprints of the series No. 1. Moreover, in the newly exposed footprints of the same animal, where the impress is made several inches deep in the softer soil, there is no indication whatever of a sandal. Nor in many footprints which I examined on the lower floor is there any such suggestive margin. With the palpable evidences before me, I can see no other logical deduction that that the animal was a quadruped; whether a megatheroid or a bear I leave for the paleontologists to decide. It is the solution of a mechanical problem by actual graphical demonstration.

Fragmentary Character of Tusks, Teeth and Bones.

A word more of the character of the deposits after the mud layers of the upper and lower floors had been covered by them.

The first 10 feet is composed of very sharp, small grains of sand from disintegrated quartz and other materials. It has been deposited by swiftly moving waters as indicated by the markings of the numerous deposits lying at many angles, and having been partially cut away and redeposited many times.

In this stratum are found the jaw bones heretofore described by Mr. Gibbes, pieces of elephant tusks, fragments of bone and of teeth, the tooth of an elephant, of which I furnish a drawing; and the matrices made by pine cones, and pieces of wood. All these fossil remains are fragmentary and scattered, indicating that they have been water-borne by the strongly rushing waters which brought down the sands, and that the source from whence they came was up the stream at a higher level.

[A series of diagrams to scale was used by Professor Davidson for reference as he proceeded with his report.]

MONTANA COMPARED WITH DAKOTA.—Here is what a tourist through Montana writes to his home paper: "I am certain that this great Territory, 500 miles long and 300 miles wide, contains more natural wealth than any other State or Territory in the Union. It is the least known, with perhaps the exception of Idaho; but if what has been discovered of its mineral resources is a fair standard, in a very short time all the rest of the Union will have to yield the palm to this favored section of our country. It is curious to compare the surface of Montana with that of her great neighbor, Dakota. Dakota is peculiarly a farming country, while Montana is a mining and grazing country. Dakota rolls smoothly away in gentle undulations, not unlike the swells of the ocean. From the summit of these swells the eye becomes fatigued with the sameness of the landscape. Montana, on the other hand, is adorned with majestic scenery of rock and mountain, in whose bowels are secreted every variety of metal. About one-half of the Territory is mountainous, the other half being good arable land capable of the highest cultivation, yielding abundantly agricultural products of all descriptions."

Tributes to California.

We enjoy tributes to California. There is no land more worthy of eloquence, no clime in honor of which orator and poet can more truthfully attune their praise. It is our home—the gladsome land to which we have come from all parts of the earth and proclaim the most fit abiding place. It gives us joy to find our own citizens glorifying the State, and to hear the appreciative tributes of the sojourners. Hence we give space to a few honest, earnest words about California which have been recently spoken in public places.

The Conclave of Knights Templar gave opportunity for the exercise of oratory, and naturally enough California, to which the pilgrims had come, was often the theme. We propose to cull the paragraphs bearing such comment. Ex-Governor Perkins, in welcoming the hosts, thus describes the land which received them with gladness:

California is our home, the land of our choice. We have seen its great cities spring as by the touch of a magician's rod from canvas huts and willow cabins. The wild cattle and beasts of the forest roamed at will where now run the great railroads and telegraph, and the trail of the Indian has been obliterated by the march; of civilization. These spacious bays and rivers these productive valleys, abounding with fields, orchards, vineyards and happy homes; these hills and dales, and mountains of solemn grandeur, veined with the precious ores, make it indeed a land of promise. Our valleys and hillsides, with varied and prolific soil, produce the fruit and the vine, vegetables and cereals, in such abundance that the crowned prince, the peasant and the artisan of Europe supply their tables with luxuries from our surplus store.

We point with pride to our schools, colleges, churches and benevolent institutions, as well as our increasing commerce, our growing industries, and in this line our surely coming possibilities. And of our climate—between our southern boundary, where grow the orange, the pomegranate and the vine, and our northern border, where Shasta rears his majestic summit above the clouds and, clothed in eternal ermine, reflects his sunshine to the sea—there is not a mile of latitude but that has its varied climate. The cool and invigorating breezes experienced here, and born of the breath of the Pacific, pass from its sounding shore across the valleys, warmed and softened by perennial sunshine, and finely rarified and rising it sighs itself away on the tops of the Sierras, to return again in God's good time ladened with the odor of fruits and flowers, the product of our land and the result of our toil.

Upon another occasion, Gov. George Stoneman, in welcoming the Sir Knights on the part of the State, spoke as follows:

Within the long limits of our State lines you can all find a congenial resting place. To those of you who come from the ice-bound mountain regions of old New England, we tender in exchange the pine-clad, snow-capped grand old Sierras. Should your homes be located on the prairies of the great Northwest, they can be replaced by other homes on the broad plains of the Sacramento and San Joaquin. For the harsh salt winds of the Eastern seabord we offer you the soft, balmy sea trades of the Pacific coast, and for the Atlantic ocean's roar, the thunders of the everlasting waves from the distant shores of old Cathay.

California is on the great highway of the commerce and travel of the world, midway between the East and the West, a toll house as it were for the traffic of the globe. She has had her ups and her downs, her dark days and her bright ones. Fate has frowned and Fortune has smiled. At one time engulfed by floods, at another consumed by fire; but notwithstanding all this, her growth has been steady and rapid. Fortunes have been made of fabulous extent in the short space of one generation, and palaces have been reared by nabobs and millionaires that vie with those of the world in extent, grandeur and display. In commercial circles, the reckless venturesome spirit of early days has largely given place to legitimate business methods, and where our bulls and bears a few short years ago met in daily combat, all is now quiet and serene. I am glad to observe that unlike the Knights of old, you have taken with you upon your pilgrimage the ladies fair to whom you have sworn your knightly devotion, and in the heartfelt welcome which is extended to you, let them not think themselves forgotten. If there is any one thing that California is proud of, it is its ladies—its wives, its mothers and its daughters—and that they have so cordially welcomed their sisters of all the East is but an evidence of that hospitality which we trust is second in California to that of no other State in the Union.

J. D. WALKER, of the firm of Falkner, Bell & Co., for the past two months or so has been on a visit to Scotland, on business of a special and important character. During his absence he has successfully negotiated the transfer of a large area of California timber lands, for a sum aggregating between $1,500,000 and $1,750,000, to a recently organized corporation in Scotland, known as the California Redwood Company, of which, it is understood, the firm of Falkner, Bell & Co. will be the representative agents on this coast. The purchase embraces lands, mills, tugs, embarcaderos, and other incidental accessories to the general lumber trade.

Butte and its Bullion.

Green Majors, of the Butte *Inter-Mountain*, makes the following brief statement concerning Butte and its bullion:

Butte has been known for sixteen or twenty years as a very rich placer mining camp. It is located just over the Pacific slope divide, at the extreme head of the Columbia river, and on Silver Bow creek. It now has a population of from 8,000 to 9,000, about one-third of these entering camp about two years ago. Heretofore the city has been reached from the Union Pacific by the Utah and Northern road, which entered Butte twenty months ago. In a few days its connection with St. Paul will be made. The Utah and North ru runs a narrow gauge road above Butte to its junction with the Northern Pacific, which is a few miles west of Helena.

The Mining Interests.

The city is on a gentle slope, is crowned by the Alice mine, which is about two miles from the creek, and on Butte hill. It is in Silver Bow county, and in the Summit Valley mining district. Some five or six years ago the city became known as a quartz district, and is now a huge quartz camp, with from 300 to 400 mine locations. The work going on in the mines is shown by there being about 25 steam hoists in operation. There are 4 smaller ones in operation, which have a capacity of 325 tons of ore a day, and another is now in process of erection which will have a capacity of 500 tons daily. The stamp mills are as follows:

	Stamps.
Alice	80
Lexington	40
Dexter	20
Moulton	40
Lexington, No. 2	20
Centennial	15

There are two or three smaller mills, and the Silver Bow mill of 20 stamps, which is not connected with any mine, but is known as a custom mill.

Prominent Mines.

The prominent mines are the Alice, Moulton, the French Syndicate Lexington, which in the first six months of 1883 had an output of $741,000; the Colusa, which shipped 8,000 tons of copper and silver matte last year; the Anaconda and the Lawrence, on which $2,000,000 has been spent in development, hoist and reduction works by its owners, Haggin & Tovis, of San Francisco; the Bell, which produces 100 tons of ore daily; Gagnon, National, Andy Johnson, Liquidator, Parrot, Shakespeare, Anglo-Saxon, Posa and Magna Charta. About two-thirds of the developed mines are gold and silver, and the balance copper and silver. The output for the camp this year is estimated at between $6,000,000 and $8,000,000. This is composed of gold and silver bullion, and copper and silver matte. The ore and matte are at present being shipped to Omaha, Denver, Chicago, Baltimore and Europe.

The Veins and Smelters.

The point of excellence in the mines is that they are on true fissure veins, six in number, and many experts state that the ore is good for 100 years' supply. In the silver ore the gold is found; in the copper, silver ore is found. The copper ore paye to work, even when the market is down, as the silver extracted pays for the labor.

The trouble there is to get the ore reduced. All the stamps connected with the mines are kept busy with their own output, and thousands of tons of ore are awaiting the custom mill. On the Pacific coast, ore of $5 and $6 a ton is worked; but in Butte, ore worth $25 a ton is throwu on the dump as too low a grade to be handled. Some of the rich mines handle low-grade ore by condenssrs and water, using Cornish rollers to bring out the quartz. These little bits of machinery, including smelters and stamps, cost $100,000 or more, and the mine owners are too poor to build them, and thus would like Eastern capital to put up custom stamps and smelters, as the price now charged and scarcity of apparatus makes it ruinous to them. The fuel is not very plenty in Butte at present, but a fourteen-mile flume has been built to bring it down. The coal is at present brought from Wyoming and Utah, and the Yellowstone valley is now developing some mines.

In the city there are five churches, schools to seat 500 pupils, and a new one, to cost $5,000, is to be built. A court-house to cost $125,000 is now under way. A complete water works furnishes good water and strong pressure. The county is the smallest in the Territory, but its tax list is the largest, and showed last year property to the value of $5,600,000. In the surrounding county are a number of camps, such as Basin, Wickes, Iron Mountain, Silver Star, Gleudals, etc.

LONG RAILS.—It is said that the Philadelphia and Reading Railroad Company proposes hereafter to use on their roads rails 60 feet long, instead of 30, and will begin their manufacture at once. The rails will also be increased in weight from 68 to 70 pounds per yard. The decreased number of joints to cars for will lessen expenses, it is thought; but there are difficulties in the way of handling and transporting the 60-foot rails, which trackmen will understand.

GEORGE REVETT has been appointed Superintendent of the South Pacific Coast Railroad, vice A. H. Fracker, whose resignation takes effect October 1st.

USEFUL INFORMATION.

How Perfume is Extracted.

One of the best methods of obtaining perfumes is by the use of grease. The process is called maceration. The best fat employed is marrow, which is melted in a water bath and strained. While it is still warm the flowers are thrown in and left to digest for several hours. They are then taken out, and fresh ones are placed in the grease. This is continued for several days. The grease and perfume are then separated by the use of of alcohol. Beef marrow is not the only substance used in extracting the odors from the flowers. Inodorous oils are also used, especially refined olive oil, which is more extensively employed in the south of Europe. The process used for delicate plants, such as jessamine, tuberose and cassia, which will not allow the use of heat, is on the principle of absorption. A layer of purified lard and such mixture is spreal on the glass bottom of a square wooden box, and upon this freshly gathered flowers are spread every morning as long as the flower is in bloom. The boxes are kept shut, and the grease soon acquires a very strong odor. In saturating oil, instead of glass bottoms to the boxes, wire ones are used, upon which cloths soaked in oil are laid, and the boxes or frames are piled upon each other to keep them close. After ths oil soaked cloths are sufficiently charged with ths perfume, they are placed in a press and the oil squeezed out.

Tar as Fuel.

M. Le Treust gives some data relating to the use of tar as fuel in the Vangirard Gas Works, the model followed being that of the tar furnaces of the gas works at Breme, designed by M. Servier. M. Le Treust mentions the disadvantages usually accompanying the use of tar as fuel, including the rapid destruction of the retorts, the extreme care necessary to maintain a regular flow of tar, and the liability to smoke. All these inconveniences are claimed to have been overcome by the arrangements perfected by M. Le Treust, which consist of a special form of injector, working in a furnace to which the air supply is regulated to a constant quantity. To insure fluidity, the tar used is taken directly from the hydraulic main. In order to utilize the great radiant power of the burning tar, the retorts of the setting of six are left as bare of brickwork as possible, being supported only on three narrow arches in their length, the middle of the setting being left void. Finally, the front wall is kept cool by the passage through it of the air required to support combustion. Eight settings of six retorts, working for a psriod of 434 days, carbonized 19,259,200 kilos. of coal, and consumed 2,345,750 kilos. of tar; being 675 kilos. of fusl per bench per day, or 12.17 kilos. of tar per 100 kilos. of coal carbonized. From these figures M. Le Treust concludes that tar firing is as good as coke, since ths production of gas is as large, the retorts last as long, and ths consumption of fuel is only 12 per cent of the weight of coal carbonized.

RAINBOW COLORS.—Rainbow colors are produced on brass ornaments, such as clasps, buttons and buckles, by stringing them on a copper wire and dipping them in a bath of plumbate of soda freshly prepared by boiling litharge in caustic soda aud pouring it into a porcslain dish. A linen bag of finely pulverized litharge or hydrated oxide of lead is suspended in ths solution, so as to keep up ths original strength of the solution. While the articles are in this solution, thsy are touched one after the other with a platinum wire connected with the positive pole of a battery until the desired color appears. The galvanic current employed must not be too strong. The colors are more brilliant if they are heated after they have been rinsed and dried. Colored films are more conveniently produced upon a bright brass by different chemicals, by painting with them or hy immersion. For example: golden yellow, hy dipping in a perfectly nsutral solution of acetate of copper; dull grayish gresn, by repeatedly painting with very dilute solution of chloride of copper; purple, by heating them hot and rubbing over with a tuft of cotton saturated with chloride of antimony; golden red, by the uee of a paste made of four parts of prepared chalk and one of mosaic gold.

PEANUT FLOUR.—The valne of the peanut crop of this country for the current year is estimated by the Savannah *Telegram* at $3,000,000. That paper saye tbat "the Virginians are beginning to turn the peanut into flour, aud say it makes a peculiarly palatable 'biscuit.' In Georgia there is a custom, now growing old, of grinding or pounding the shelled peanuts and turning them into pastry, which has some resemblancs, both in looks and taste, to that made of cocoanut, but ths peanut pastry is more oily and richer, and, we tbink, healthier and hetter every way."

HORN FROM SEA WEED.—Under the generic term, "sea weed," the sea beachee offer to use as fertilizers a numbsr of distinct vegetable productions, and two of them, at least, are recognized as materials for food. The *Rhodomenia palmata*, or dulse, is frequently sold on the streets of our seaside cities, taking the place of the school girl's chewiug gum, while the *Chondus crispus*, known commercially as "Irish moss," is a favorite for the preparation of jellies and blauc mange. Now, it is claimed, that by experimeut the *Zostera marina*, or "wrack," can be made to yield, by treatment with mineral acids, a substance resembling horu, capable of being manufactured into forms, and of receiving color from pigments. This substance is called "algin," from *alga*, the generic name of one common species of sea weed. The crude material can be obtained in large quantities on all exposed shores, and its preparation for ultimate manufacture is a cheap process.

THE following is clipped from the catalogue of a well-known emery-wheel manufacturer: "We lately asked a prominent manufacturer (too critical to be easily suited) what he really did want. 'We want,' said he, 'a wheel to cut like thunder and last forever.' Now bear in mind that you can't have both. You must choose. If you want a wheel to 'cut like thunder,' you must have a soft wheel which will cut freely and create little heat, but which will wear out fast. If you want one to 'last forever,' then you must have a very hard one, and that will cut slowly, will have to be forced hard against the work, and may create heat enough to case harden your saw or other work."

PRESERVING AND WATERPROOFING FABRICS.—Piron deserihes in the *Moniteur Industrielle* a new process for rendering paper or cloth waterproof, and at the same time protecting it from change. He employs an alcoholic solution of the agreeable oil used to perfume Russia leather, and which is obtained by distilling white birch bark. The oil dissolves readily in alcohol, but is no longer soluble after it bas once dried and became oxidized to a resin. The thin film of resin formed by impregnating the fabric does not detract from its pliability in the least, and its aromatic odor protects it from insects. It protects quite well sea water, acids, and moderate changes of temperature.

ANOTHER process of imprsgnating wood for its preservation has been patented in Germany. This consists in first treating the wood with a solution of zinc vitriol, and then with a solution of chloride of calcium, so that the preservative coating is formed upon the wood hy ths chemical action of both substances upon one another.

AN imitation of ground glass can be produced hy dissolving two tablespoonfuls of Epsom salts in a pint of lager beer, and paintng the glass with the mixture. When dry the glass will appear as if frosted.

GOOD HEALTH.

The Medicaments of Brutes.

In a communication to the Biological Society of London recently sent by M. Delaunay, on the medical practice of animals, the doctor gave some interesting facts, from which he argued that the human reason ought to be trusted as much as animal instinct in many instances where medical science seems to be a fault; and he insists that the desire of sick persons for certain foods and drinks may be a natural instinct rather than a morbid fancy.

But he does not state how the one may not be mistaksn for the other. In his list of examples of medical instinct in the lower animals, M. Delaunay, says that animals bathe for cleanliness and health, that they get rid of their parasites by using dust, mud, clay, etc. Those suffering from fever restrict their diet, keep quiet, seek darkness and airy places, drink water, and sometimes plunge into it.

When a dog has lost his appetite, it eats that species of grass known as dog's grass (*dogtooth*), which acts as emetic and purgative. Cats also eat grass. Sheep and cows, when ill, seek out certain herbs. An animal suffering from chronic rheumatism always keaps, as far as possihle, in the suu. If a chimpanzee be wonnded, it stops the bleeding by placing its hand on the wound, or dressing it with leaves and grass. When an animal has a wounded leg or arm hanging on, it completes the amputation by means of its teeth. A dog, on being stung in the muzzle hy a viper, was observed to plunge its head repeatedly for several days into rnuning water. This animal eventually recovered.

A sporting dog was run over by a carriage; during three weeks in winter it remained lying in a brook, where its feed was taken it. The animal eventually recovered. A terrier hurt its right eye; it remained lying under a counter, avoiding light and heat, althongh it habitually kept close to the fire. It adopted a general treatmsnt, rest and abstinence from food.

The local treatment consisted in licking the upper surface of the paw, which it applied to the wounded eye, agaiu licking the paw when it became dry.

The doctor thinks that veterinary medicine, and perhaps human medicine, can gather from these facts uscful indications, precisely bccause they are prompted by instinct.

Milk Diet in Bright's Disease.

Since we know not at present any drug that possesses therapeutic value to any marksd extent in this terrible and fatal diseaso, and since it is daily making sad havoc among human being, and prineipally among that class who, by reason of their valuable public labors, are particularly necessary to the welfare of the world, therefore it becomes a medical question of paramount interest that we should discover some poteut method of combating this very prevalent disease. Some years since, Carel first called attention to the treatment of Bright's disease by the use of milk diet, and since then Duncau, as well as many other prominent physicians, have written on this subject. We have ourselves seen some remarkable results follow this treatment, while Dr. S. Weir Mitchell, of our city, is now quite an enthusiast on this subject. This method of treating a formidable disease has received sufficient distinguished indorsement to recommend it seriously to our notice. We would, therefore, ask all physicians who read this article to try this method of treatment, and to furnish us with their experienec, which we will publish. The milk is used thoroughly skimmed and entirely freed from butter. To procure the best results, it has been advised that the patient shall restrict himself absolutely to milk, and continue the treatment for a long time. If it disagrees with the stomach (as it will in some cases), Dr. Mitchell advises that the patient be put to bed, and the treatment commenced with tablespoonful doses, to which lime water is added until the stomach tolerates the milk, when from eight to ten pints daily should be taken, and absolutely nothing else. The sanction of such a distinguished physician as Dr. Mitchell forces us to seriously consider the merits of this treatmeut, and we trust to receive the experience of all readers of this journal who may have cases of Bright's disease to trsat. —*Medical and Surgical Reporter.*

POISONOUS MAPLE SYRUP.—The commou practiee of using galvanized iron pans for boiling maple syrup is by no means so free from danger as has been supposed. At the last meeting of the Ohio Mechanic's Institute, a paper was read by a chemist, in which a case was cited which clearly proves the dangerous character of zinc when used for such a purpose. As is well known, galvanized iron is simply sheet iron covered with zinc. If the sap is perfectly sweet, it will corrode the zinc but little; but if it has become a little sour by standing too long before being boiled, a very considerable amount of zinc may be dissolved; in one reported case amounting to nearly an ounce of zinc sulphate to the gallon of syrup. This is the cause of the metallic taste which many persons who use maple syrup freely must have frequently noticed. A considerable quantity may be present, however, without being detected by the taste. Until some better means of condensing the sap is found and adopted than the galvanized iron vessels now in use, we would advise those who are particular as to the quality of what goes into their stomachs to avoid the use of maple syrup, unless they know that it is not contaminated with zinc.

IT SEEMS to be a well recognized fact that human beings cannot exist in a state of health on animal food exclusively for any great length of time. Vegetables are necessary to prevent certain diseases, and to remove those diseases when they have invaded the system. But vegetables can be used as an exclusive dict and yet maintain the body in a state of perfect health. Herodotus implicitly attributes the activity and healthiness of the Persians of his time to the variety and abundance of fruit and vegetables which they consumed. They had at meals not only several dishes, but several courees of vegetablo food preceding a very moderate allowance of solid meat. Chambers says: "I feel sure that tho puniness, infertility, pallor, fetid breath and bad teeth which distinguish some of our town populations, is to a great extent due to their inability to get these articles of the table fresh.—*Cor. Sanitarium.*

WARTS.—Are warts caused by impure blood? and what is the best way to remove them? How about charming them off? In answer to the above the *Herald of Health* says: Warts are not caused by impure blood, but many exist in otherwise healthy persons. There are many waye of curing them. Perhaps as good an one as any is to touch them daily with strong acetic acid. Be carcful not to let the surrounding skin he touched, however. You wish to know if warts can be charmed away, and if so, how? Warts often disappear suddenly and from no apparent cause. Had the owner charmed them he would have believed this was the cause of the fright. They may disappear after "charming," and one method is just as good as another. Warts may be strangled by tying a tight ligature round the base of each.

TEMPERATURE OF A BATH.—The proper temperature for a bath is the oue which feels agreeable and comfortable, and not the one that feels hot or cold. Of course these may be necessary in certain cases. As a rule a bath may last as long as it is agreeable. This may be one minute, five minutes, or longer. Those who have accustomed themselves to hot baths may lower the temperature gradually and soon accustom themselves to a cold or cool bath.—*Herald of Health.*

VEGETARIANISM AND GOUT.—An old English doctor reports that he has nsver been successful in the treatment of gout, except in cases in which he required total abstiuence from animal food, as well as from wine.

DIPHTHERIA.—It is said that decaying cabbage will produce diphtheria sooner than any other nuisance about the house.

MINING AND SCIENTIFIC PRESS

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SAN FRANCISCO:

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☞ *See Advertising Columns.*

Passing Events.

The fair season has been inangurated by the opening this week of the two more important ones, the State Fair at Sacramento, and the Mechanics' Institute in this city.

The driving of the last spike on the Northern Pacific railway is an event of great importance. It was done with appropriate ceremonies, and completes the third great transcontineutal railway. To the northwest this road will bring thousands of settlers, and huild up cities and towns, so that an immense region will be brought into cultivation, and into commercial intercourse with the rest of the world.

Mining news of importance is rather scant. Winter will soon drive the prospectors indoors in the mountain regions, though in the milder climate prospecting will continue for weeks to come.

RAILROAD MEETING.—There will he a great gathering of railroad men in this city on the 20th inst. The object is a convention to make certain "fare" arrangements. The railroads which will be represented are the Union Pacific; Central Pacific; Southern Pacific; Galvestou; Harrishurg and San Antonio; Atchiuson, Topeka and Santa Fe; Missouri Pacific; Texas Pacific; Atlantic and Pacific; Northern Pacific (Villard) and Denver and Rio Grande. Besides these roads a great many branch lines will be represented. The meeting will be the most important of its kind ever held on this coast.

Electricity, Cables or Horses?

There will shortly be an opportunity in this city for a very interesting comparative test as to the relative merits of systems of street car propulsion. The line which runs through the city on Mission street is ahout to adopt electricity as a mtor, using storage batteries placed under the seats in the cars. On a parallel street one block away with almost precisely the same grade, runs a new road on the underground cahle system, having all the newest appliances and best equipment possible to procure. No expense has been spared in the construction of the road or its outfit, and it may be said to be a model in this respect. It runs at a higher speed than any other cahle road in the city, and has heavy cars and dummies. Being the principal thoroughfare of the city and in a thickly settled portion, the cars carry heavy loads, especially in the mornings and evenings.

The Mission street road, like that on Market, runs from the ferries out to the ontskirts of the city. It runs one-horse cars at present, and no doubt its patronage has fallen off since more rapid communication has heen made by the other road, which is only a hlock off. It will now try the experiment of electricity in place of horse-flesh. The system is no experiment, so far as practicability is concerned. The question of expense is the only one to solve. And it is this that is of the greatest interest. Can we run cars cheapest by the cable or the electric system?

It has been found by experience that the eable system of operating street railroads costs much less than when tbey are run by horses, and the capacity may he increased at any time very readily. There is greater speed, better accommodation for passengers, and an improvement of the traffic in every way. In these respects it is hardly probable that electricity will excel the cahles. If, however, it ean cheaper still more the operating expenses a very great point will have been gained.

San Francisco was the first to introdnce and bring to perfection the cable system of operating street railroads; and now there are a number of successful lines running, others heing constructed, and still others planned. Eastern and European cities, profiting by our example, are introducing these roads.

We will now be ahle to show to the world the relative merits of the three systems. On three parallel streets with abont the same grades—all nearly level—will be the three systems. On Howard street are ordinary horse cars; one hlock away will be the cars run hy electricity, and one hlock from that the cable cars. The roads are of nearly the same length and have the same class of traffic. There will be an excellent opportunity to get the practical experience the world needs on the questions of street car propulsion, and we shall look forward with interest to the time when these results will he forthcoming.

Opening of the Mechanics' Fair.

On Tuesday last, the eighteenth annual exhibition of the Mechanics' Institute was formally opened in this city. The formal opening exercises were held at the Grand Opera House at two o'clock in the afternoon. Schultz' band was in attendance and furnished the music. The Rev. James Matthews delivered the opening prayer, and was followed by A. W. Starbird, Vice-President, who, in the absence of President Cornwall, delivered the opening address. The oration was hy the Rev. Robt. McKenzie, on the subject, "Tools and the Man," from which we shall quote on another occasion.

In the evening the exhibition building was opened. Though, as usual, there are many vacant spaces, all are now heing rapidly filled up. Mr. Culver, the Secretary, thinks that in variety of exhibits the fair excels former ones. The machinery department is entirely separate, so that the noise of the moving mechanism is not noticed in the main building. The mechanical display is somewhat larger than usual. Many changes have been made in the general arrangement. The decorations are well spoken of, and there are two aisles instead of one on the main floor. The art display is creditahle; and the garden is quite attractive. The fair is run in good order, and there are many more things worthy of examination.

Curve of Quartz-Mill Cams.

The proper curve of the face of a cam in a quartz mill, in order that it may perform the desired duty with the least friction, is the involute of a circle the radius of which is equal to the distance between the center of the cam shaft and the center of the stamp stem. This produces a line for the face of the cam which meets better than any other the various requirements. The bottom of the tappet is constantly perpendicular to the radius of the curve of the cam. The tappet, and with it the stamp, is lifted vertically and uniformly, so that the lift of the stamp is always regularly proportioned to the revolution of the cam shaft. The cam curve may be constructed on paper, by means of tangents, but in practice the line of curvature is produced by cutting from a thin hoard a circular piece the radius of which is equal to the horizontal distance from the center of the cam shaft to the center of the stamp stem. At a given point on the periphery of the circular piece is fixed one end of a thread, which must have the length of the greatest desired lift of the stamp, and to the other end of which is attached a pencil point. The circular piece, with the attached thread wound on the periphery of the circle, is laid on a smootb board on which the line is to he traced, and the thread, heing constantly stretched to its furthest reach, is unwound until it forms a tangent to the circle, at the point where the other end is attached. The line described hy the pencil point is the desired curve. Some builders slightly modify this curve, giving to the cam arm a greater curvature near each of its ends, in order that the cam in its revolution may come in contact with the tappet at the least practicahle distance from the cam shaft, where the concussion is less than at a greater distance, and to diminish the friction between the extremes of the cam and the face of the tappet. The face of the cam is 2 or 2½ inches wide. Its extreme end is fashioned so as to correspond to the onter edge of the tappet, which is circular. The cam is placed as near the stamp stem as practicable without coming in contact with it.

Lower California Gold Mines.

We learn from Guaymas that the gold mines in Lower California are still giving favorahle returns. Parties are daily arriving in that part from the States, mostly from Tucson, bound for the placers. Not long since Mr. Harry Emeric from this city with a dry washer went to Guaymas en route for the mines. Luis Garcia, of that city, is said to have heen taking out as much as $50 per diem, and in one week made $7,000. Ten dollars a day is confidently expected hy all those going down. The line of travel is either hy sea or rail to Guaymas, then by schooner to Trinidad bay, and then a tramp or mule ride of 120 miles across rough country. Of provisions there are none, and those venturing to the placers should take at least a three months' supply. The summer has heen exceedingly hot along the Sonora coast as well as in Lower California, which has deterred many from embarking in a gold rush; hut with the approach of the cold weather a veritahle gold excitement is expected. We have before spoken of the many disadvantages of this region.

Placer County Notes.

In Placer county, just at present, there is no hydraulic mining going on, and mining matters are not very brisk. The Gold Blossom mine is being worked as usual, and is paying well. The Belmont is sinking a shaft and running drifts. The Morning Star is taking out and crushing ore that is paying from $17 to $20. There is a large body of that grade of ore at the depth of 300 feet. This is one of the most promising mines in the region. The Mayflower (drift and hydranlic), at Forest Hill, has a fine hody of cement gravel at their shaft, where they are putting up hoisting works. The mine is now being worked by the drifting process. At the Succor Flat drift mine, near Iowa Hill, they have just completed sinking an air shaft 320 feet deep, by which means they will be enabled to put a large force of men at work, and take out a large amount of gravel. With only four men, they have averaged four ounces a day. The mine is a very good one. The tunnel is in 2,000 feet. These points we obtained in a conversation this week with Mr. R. L. Dunn of Auhurn.

Running Gear of Amalgamating Pans.

It has been found that, on account of the yoke being attached to the top of the shaft, and hanging to it with the weight of the muller in an amalgamating pan, the shaft bears with great friction upon the upper part of the cone and soon wears itself so much that it no longer forms a good bearing. In order to remedy this, it is usual to pour into the journal around the shaft enough babbitt metal to form a bearing surface for the shaft, and thus protect it from wear. The objection to this is that the babbitt metal wears very soon, and it is quite an operation to remove it in order to pour in more. The charge in the pan is liable to run over and the quicksilver gets upon the babbitt and causes it to wear very fast. To remove the babbitt the gear below has to be taken off and the shaft removed. The babbitt is then chipped out with considerable labor, and the parts put together again and more babbitt poured aronnd the shaft, which takes up time. If the shaft is at all worn, the babbitt holds it so tight that it cannot easily he raised up, and much labor may be required to move the cone itself.

Charles Gracey, of Contention, Cochise Co., Arizona, has just patented through the MINING AND SCIENTIFIC PRESS Patent Agency a new means of constructing the journals or hearings of the operating shafts in amalgamating pans, designed to overcome these objections. It consists in providing an adjustahle and removable gib fitted within the central hollow stationary pillar, called the "pan cone," at points of wear, and forming a suitable bearing for the upright revolving shaft operating the muller. The object is to provide a hearing which when worn may be adjusted or removed for the substitution of a new one, whereby the shaft may be kept steady and he preserved, being at the same time easily removable.

In the ordinary construction of an amalgamating pan a yoke connects the muller with the vertical shaft, which passes down through the bottom of the pan and carries a gear. This meshes with another gear on a horizontal driving shaft, motion heing thus transmitted to the muller. The upright shaft passes through a hollow central pillar, usually denominated the pan cone, which forms a journal or bearing for the shaft. In the top of this cone Mr. Gracey provides a recess in its inner side, extending down a short distance, and with this is fitted a gib, the inner surface of which continues that of the cone and forms a bearing surface for the shaft. It is made of any suitable metal—preferahly brass or babbitt—and is easily removable. When it wears above, as it is likely to do first, it may be adjusted by raising it higher, so as to present a new and narrow bearing surface. This gib, while preserving the shaft from wear, will allow its ready removal when necessary, simply by its own removal. When worn out this gib may be taken out and changed. It may be placed at any point above the shaft. Mr. Gracey has found by experience that the greater portion if not all of its wear occurs on that side of the bearing towards which the muller and vertical shaft revolve, and between points about ten degrees removed from the line of the horizontal driving shaft. Therefore there will be need of only one gib, and that placed a little to one side of the line of the horizontal shaft, and on the side towards which the vertical shaft revolves, as it will be found that almost all the wear is at this place. Babbitt metal may be poured in aronnd the shaft in other places, and thus the shaft may be preserved.

THE oyster dealers of New York City propose to pool their issues and organize an exchange, just as the produce merchants and stockbrokers. The oyster trade is going up so tremendously that it will be necessary to unite in order to protect it. Oyster men now do a heavy business in furnishing oysters for European markets. It has all grown up within the last five years.

FROM a recent investigation into the mortality referable to alcohol, conducted by a committee of the Narveian Society, it appears that the rate in London is fourteen per cent of the total number of deaths in the adult population. About twice as many occur among men as among women.

THE Central Pacific Railroad Company is erecting a water-tank at Winnemucca, Nevada, that will hold 52,000 gallons.

Blasting in Mines—No. 8.

Force Required to Cause Disruption.

When the line of least resistance is known, it remains to determine the quantity of the explosive compound required to overcome the resistance along that line. This matter is also one of great importance, for not only is all excess waste, but this waste will be expended in doing mischief. In mining operations, the dislodged rock is violently projected to the injury of the sides of the heading or the shaft, and the air is fouled in an unnecessary degree, and in quarrying stones are shattered which it is desirable to extract in a round state. Of course, it is not possible so to proportion a charge to the resistance that the rock shall be just lifted out and no more, because neither the force developed by the charge nor the value of the resistance can be known with precision. But a sufficient approximation may be easily arrived at to enable us to avoid the loud report that is indicative of what may be called "superfluous" waste. The lavish expenditure of powder which is everywhere made does no honor to the mining engineering profession, and it becomes all interested to direct attention to this matter.

The common miner, or quarryman, acting in accordance with his rule of thumb, fills his bore-hole up to a certain height with the explosive substance, and this condition must be fulfilled irrespective of the diameter of the hole, the nature of the rock, or the length of the line of least resistance, along which the rock will be fractured. More than this, the rule must be followed irrespective of the strength of the explosive, for not unfrequently dynamite, even, is made to fill the same portion of the hole as gunpowder. This source of waste claims immediate attention, and opens a wide field to economy.

Charges of powder of uniform strength produce effects varying with their weight; that is, a double charge will move a double mass. And as homogeneous masses vary as the cube of any similar line within them, the general rule is established that charges of powder capable of producing similar results are to each other as the cubes of the lines of least resistance. Hence, when the charge requisite to produce a given effect in a particular substance has been determined by experiment, that necessary to produce a like effect in a given mass of the same substance may be readily determined. As the substances to be acted upon are various, and differ in tenacity in different localities, and as, moreover, the quality of the powder may vary considerably, it will be necessary, in undertaking mining operations, to make experiments in order to determine the constant which should be employed in calculating the charges.

One pound of gunpowder of average specific gravity occupies, when loosely poured out, about 30 cubic inches, and one cubic foot will thus weigh 57½ lbs. Consequently, a hole one inch in diameter will contain 0.416 oz. for every inch of depth. Hence, to find the weight of powder to an inch of depth in any given hole, we have only to multiply 0.416 oz. by the square of the diameter of the hole in inches, and in this way we may determine, either the length of the hole for a given charge, or the charge in a given space. The following table will be found of practical value. We take it from Andre's "Coal Mining:"

Diameter of the hole.	Powder contained in an in. of length.	Powder contained in 1 ft. of length.	Depth of hole to contain	
			1 lb. of Powder.	1 lb. of Powder.
In.	Oz.	lb. Oz.	In.	In.
1	0.416	0 4.992	9.615	38.461
1¼	0.650	0 7.800	6.153	24.615
1½	0.936	0 11.232	4.273	17.094
1⅝	1.274	0 15.288	3.139	12.558
2	1.664	1 3.968	2.403	9.615
2¼	2.115	1 9.380	1.891	7.565
2½	2.600	1 15.200	1.534	6.153
2⅝	3.175	2 6.100	1.259	5.039
3	3.744	2 12.928	1.068	4.273
3¼	4.394	3 4.728	0.910	3.641
3½	5.096	3 13.152	0.784	3.139
3⅝	5.850	4 6.200	0.683	2.735
4	6.656	4 15.872	0.600	2.403

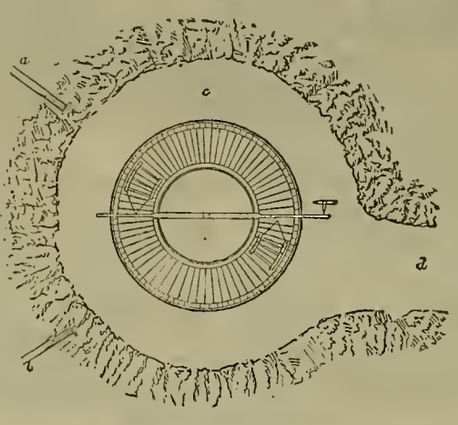
Blasting holes are never bored truly circular; but the variations of the quantity, as determined by the table, due to this circumstance, are of no practical importance.

THE San Benito *Advance* has it from good authority that the New Idria quicksilver mine, which has been successfully worked for twenty-three years, is now not yielding enough to pay expenses. The mine is running behind about $3,000 per month, and will probably be shut down before long.

Working Gold-bearing Clays.

Special improvements have to be devised for treating gold-bearing clays, and these are known as puddling machines. The original and most simple form is the puddling box, a rough wooden box into which the clay is thrown, mixed with water, and then thoroughly stirred. The thin mud is drawn off near the bottom, and more water is admitted, when the stirring is repeated. Where operations are more extended, an upright shaft furnished with strong arms is placed in the center of the tub and set in motion by a miter-wheel driven by horse or steam power. In this State puddling is seldom resorted to, because there is generally a head of water to hydraulic with, the water force breaking up the clay.

In Australia, where water is not plentiful, the puddling machine is in common use. The form is shown in the engraving on this page. It consists of a circular space whose sides and bottom are covered with hard wood or iron, and in the center of which revolves a perpendicular shaft, worked by horse-power. From the cross-beam on the shaft depend two harrows, which are dragged around the circle, and puddle the dirt on their way. Sufficient water must of course be constantly supplied. The gold and sandy matter collect at the bottom of the circle, and are removed at intervals and panned out: *a* is the water-supply drain; *b* discharge drain; *c* horse walk; *d* roadway. Occasionally steam is used in place of horse-power. On one occasion, cited by Locke in his Treatise on



HORSE POWER PUDDLING MACHINE.

Gold, from which we take these facts, a considerable quantity of silt was taken out of a sludge-drain, and subjected to crushing and amalgamation. It yielded an average of nearly two pennyweights per ton, which was considered by competent authorities to represent about the average loss from puddling machines, and at Sandhurst an indication of the richness of the dirt.

THE DEBRIS SUIT.—The Woodruff-North Bloomfield debris suit has been set for the 24th inst. The case will be heard by Judges Sawyer and Deady sitting in bank. The testimony which was taken before Messrs. Clement Bennett and I. H. W. Riley, special examiners, will be filed by the 20th, and will amount to about 12,500 pages. The testimony, instead of being written out in longhand, as is usually done by shorthand reporters, has been transcribed on the caligraph, which makes three copies and is much easier to read than manuscript. The examiners have been sitting from the 1st of June until the 7th of September. George Cadwalader of Sacramento and I. S. Belcher of Marysville have been present throughout the examination for the plaintiff; and William M. Stewart, James K. Byrne and W. C. Belcher represented the defense. The Anti-Debris Association of the Sacramento valley was represented by S. W. Sexey, their President. L. L. Robinson, President of the Miners' Association, also represented the defendant. The case will probably take a month to argue.

THE mines in Big and Little Cottonwood are doing better than in the past six years. A large amount of rich ore is coming down daily.

NEW YORK CITY has a population of 1,300,000. There are but 61,052 persons who own real estate in the city.

Pocket Mining.

Written for the PRESS by CHAS. S. LANG.]

The term "pocket" mine is frequently used as a term of reproach most often by parties who have large (and occasionally barren) ledges which they desire to sell, against small or narrow veins in which the gold forms in rich bunches or "pockets." It is safe to say, however, that more gold has been produced from pocket mines at less expense than from all the regular pay or milling veins in the State. A pocket mine requires no expensive machinery and no mill, because the pay ore or pocket when found is often so rich that it can be profitably crushed in a large hand mortar, there being often more gold than quartz. Pocket mines are sometimes found in the same neighborhood and in close proximity to regular pay or milling ledges. Generally speaking, pocket veins dip towards the West and are seldom more than six inches in width, sometimes not thicker than the blade of a case knife. They are frequently branches or feeders to larger milling veins, but sometimes intersect large "blow outs" of perfectly barren quartz, and are also found running parallel with large barren veins, this being the general rule in Tuolumne where this class of mining seems to be best understood. To be a successful pocket miner requires absolute familiarity with the "pocket slate," and close powers of observation, united with enterprise and perseverance. A few brains are good, but not too much; if there is any excess it should be of muscle.

Pocket veins always occur in slate, or properly, schists, or in contacts of slate and other formations, and the gold is always found upon a certain reef or "crossing" of "pocket" or mineral slate, as it is usually termed. Outside of this peculiar kind of "slate" the vein is invariably barren; thus it will be seen that the kind of slate or schist through which the vein cleaves its way is the key to successful pocket mining. The looks of the quartz is of no consequence. Any kind of quartz is pretty that is liberally mixed with gold, and no matter how lively or ribbon-like the quartz, unless associated with the proper slate, it will never "make pay;" while, on the other hand, the hungriest looking, long grained, glassy "bull rock," nay, mule quartz, will turn to nearly all gold under proper and favorable conditions.

Pocket or "mineral" slate is generally filled with iron pyrites, on the surface oxydized into mere rusty specks, but deeper down, showing their cubical form, sometimes there are no pyrites in the slate, but in that case it is streaked with iron, breaks with a glistening crystalline fracture and seems to be mixed with quartz. Pockets are usually sought and found at the head of gulches which have produced coarse gold nuggets. The first thing to be observed is the character of the slate when a reef or "crossing" of pocket slate is found. The surface dirt is panned and the "prospect" followed until it runs out by going up the hill. There is no cause for discouragement, even if no quartz is found in the pan, because a "marker" of clay is often all that the ledge consists on the surface. The ledge or stratum once found, it is panned lengthwise until the prospect weakens. The point which shows the coarsest particles or greatest amount of fine gold is the proper place to sink. The pan must be always brought into play, and the gold followed, no matter what course it may take. The best miners always pan at least once for every foot sunk or drove. Quite often the "fuse," "line," or pay chute proper, shows nothing but fine colors in the pan; at the next pick stroke perhaps several dollars are obtained, and in less than a foot more the quartz may be filled with gold through the entire thickness of the vein, it being sometimes in the form of a solid sheet "froze" tight against the slate, requiring a chisel or pinch bar for its removal. These cases are not so rare as one might think. Acute observation is needed. It has happened that inexperienced or careless miners have thrown thousands of dollars on their waste dumps. At first sight one might imagine pocket hunting to be all guess work, but it is governed by the same rules that are followed in working milling veins. The only difference between a milling chute and a pocket chute is, that while the milling chute may be 50, or 100, or 300 feet long, as the case may be, a pocket chute is seldom if ever more than ten feet in length, and sometimes not as many inches.

In the milling vein the gold is diffused regularly through a long mass of quartz; in the pocket chute the gold is concentrated in a small space and forms in rich bunches occurring one after another at irregular distances, generally from 10 to 20 feet apart and most always on a line; a prospect sometimes of not more than a few colors to the pan continuing below one pocket and leading to another; occasionally these prospects are followed for 50 feet or more before the vein "bunches" and "throws pay" again. It is a rule in pocket mining that all chutes come to the surface, and unless a "prospect" or colors of gold can be obtained by panning the surface and quartz it is useless to sink, no matter how inviting the appearance of the slate. But when gold is found, even though in infinitesimal quantity, but associated with mineral slate, the chances are favorable, and a hole three feet deep may be enough to show thousands of dollars. Some of the richest pockets have been found almost on the surface. Thirty thousand dollars was taken out some years ago near Sonora, not over six feet down. One piece, nearly all gold, weighing 18 ounces was found sticking up above the bottom of an old abandoned reservoir dug in early days by Mexicans to hold water for ground sluicing; the reservoir banks were then tested, and over $3,000 panned out from the banks. The reservoir had been dug right on top of a surface pocket, and the quartz being of a dirty brownish black color was not supposed to contain anything. This vein was followed down nearly a hundred feet and yielded other pockets.

For no intelligent reason pocket miners formerly thought that pocket mines gave out at from 70 to 100 feet in depth, but since the discovery of the Bray, Clark and Divoll pocket in the limits of the town of Sonora at a depth of about 300 feet, this opinion is not so generally held. Nine hundred pounds of gold were shipped to San Francisco from this pocket at one shipment, as the books in Wells-Fargo's office show. How much has come out altogether no one knows; the mine for some reason or other was worked very secretly. It is generally supposed that over a million dollars were divided between the three owners.

Some large pockets have been extracted from ledges in Mariposa county, also in Calaveras, Amador, Nevada, El Dorado, Placer, and as far north as Siskiyou.

There are more than a hundred men in this county who follow pocket mining exclusively for a business. Most all of them are in good circumstances, and some are wealthy. It will pay for miners to study this kind of mining. Many claims are doubtless being worked for milling claims at a loss, while if they were worked for pockets only they might pay big. All pocket veins do not pay to work in a hand mortar. Sometimes large pockets of milling ore are formed, but the same rules apply to both.

Quartz Mill Screens.

The screen forms a very important feature in the milling of quartz, as upon it depends the size to which the rock is reduced. The screen for working ores by the wet process is generally made of Russia sheet iron. This iron has a glossy, smooth surface, and should be free from rust or flaws, and be very soft and tough. The usual test of sheet iron consists in hammering a part of the sheet into a concave form. In the manufacture of this kind of screens the sheet is perforated by punches varying in size from the number 0 to the number 10 common sewing needle.

Screens are also made of pure brass wire cloth, having from 40 to 60 meshes to the lineal inch. For dry ores the wire screens vary in fineness from 900 to 1,000 meshes to the square inch. The punched plate is prepared for wet crushing. The wire cloth, though affording more discharging surface, wears out faster, and not only is more liable to break, and so permit large particles to pass through, but frequently stretches, giving meshes of irregular size.

The screens are attached to a screen frame which is secured in grooves cast in each end of the mortar, and by two lugs cast in front of the discharge opening, being held firmly in place by a wedge driven behind it in the grooves. A piece of canvas is usually hung before the screen for the crushed ore to splash against as it issues from the mortar, falling thence into the trough below.

THE Presbyterian Home Missions Society has received the following from Alaska: A party of miners returning from a prospecting tour on the Upper Yukon river ran out of provisions, and, becoming too weak to travel, the three strongest were sent forward to the coast. These reached the Presbyterian Mission station at Haines, Alaska, with nothing but their underclothing, and in a starving condition, having been without food three or four days.

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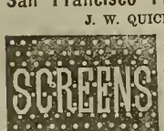
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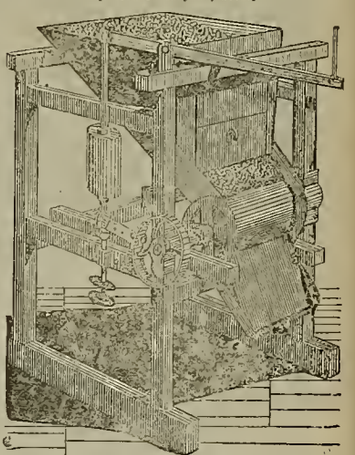
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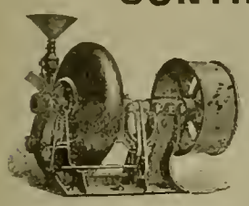
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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING SEPTEMBER 4, 1883.

284,353.—NON-EXPLOSIVE LAMP—Baer, Miner & Taylor, La Grande, Or.

284,387.—REMOVING SAND BARS—Cornelius & Turner, Turner, Or.

284,198.—TWO-WHEELED VEHICLE—Folmer & Bradley, San Jose, Cal.

284,203.—AMALGAMATING PAN—Chas. Gracey, Contention, A. T.

284,204.—DENTAL CHAIR—O. M. Graves, Engene, Or.

284,206.—HEADER SPRING—Samuel Hamilton, Salinas, Cal.

284,307.—HARROW ATTACHMENT—W. P. Kirkland, S. F.

284,309.—HARROW—J. V. Lacy, Salinas, Cal.

284,318.—FOUNTAIN PEN—Jas. B. Mitchell, Portland, Or.

284,326.—SLATE PENCIL SHARPENER—Price & Cook, S. F.

284,327.—GEAR-MOLDING DEVICE—Rasner & Walton, S. F.

284,333.—HOPPER FOR GRAIN SEPARATOR—Jas. Root, Black's Station, Cal.

284,510.—SCREW TAP—J. C. Steber, S. F.

284,514.—WATER-PROOF FABRIC—F. F. Terramorse, East Portland, Or.

3,494.—LABEL—A. C. Stoddart, S. F.

3,495.—LABEL—A. C. Stoddart, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by Dewey & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast. Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

HEADER SPRING.—Samuel Hamilton, Salinas, Monterey county. No. 284,296. Dated Sept. 4, 1883. This invention relates to a new and nsefnl improvement in the class of headers, reapers or mowers in wbich the beam is hinged to the main frame, and a long lever attacbed to the framc is operated to raise or lower the header to or from the ground. The general operation is as follows: The main frame is raised and lowered and the height of the cutter adjusted by means of a long lever extending back over the beam. By elevating this lever the front of the header is thrown down, and by depressing, it is thrown up. The stronger the tendency of the header to go into the ground, and thereby to throw the end of the lever np, the greater will be the resistance offered hy the spring, because it will be harder to raise as the lever rises. The power of the spring is therefore nicely gradnated. The lever may be operated by the exercise of small power.

HOPPER FOR GRAIN SEPARATOR.—James Root, Black's Station, Yolo Co. Cal. No 284,333. Dated Sept. 4, 1883. In the frame of the machine is the usual gang of sieves. The hopper on top has a cross slot or apertnre in its bottom. A sliding plate rests on the side of the hopper and is guided by lngs. It is held down on the side of the hopper by means of springs, which thus prevent grain from getting between the sliding plate and hopper. The top of this plate has an adjusting screw, whichextendsnp throngh a stationary nut of the hopper. By these means the sliding plate may he forced down or drawn up to regnlate the opening or slot through which the grain passes to the sieves. Under the hopper back of the feed opening is a curved directing plate for turning the grain forward on the sieves. This means for regnlating the feed is very simple.

DENTAL CHAIR.—Oriel M. Graves, Eugene, Oregon. No. 284,294. Dated, Sept. 4, 1883. The invention consists in the construction and arrangement of the parts and all the necessary adjnstments in chairs of this class. The prime object is to provide an inexpensive chair which shall be effective and easily packed for transportation. The various parts are constructed specially with this object in view.

WINDOW BLIND.—Josesph Williams, San Jose, No. 283,941. Dated Aug. 28, 1883. The patent covers improvements or a previons invention hy the same inventor. The improvements consist in means for pivoting each slat independently to enable it to turn edgewise, or means for turning them all simultaneously and in an improved ratchet-hinge in connection with the swinging gnides.

HARROW.—Joseph V. Lacey. Salinas, Monterey Co. No. 284,309. Dated, Sept. 4, 1883. The improvements consist of certain details of construction or a combination of one or more harrows, with a sulky attachment which follows the harrow, and has a common attachment with the front of the harrow so as to draw from the same point.

GEAR MOLDING DEVICE.—Henry C. Rasner and Augnstus Walton, S. F. No. 284,327. Dated Sept. 4, 1883. This is a new device for molding gears of every description and specially large work and patterns which are difficult to draw. It consists of one or more radial arms extending outward from a common center, and having one or more teeth of the pattern so connected with their outer ends that they may be advanced or withdrawn in a radial line, together with the means for moving and adjnsting the parts.

Another Overland Road.

On Saturday, Sept. 8th, the last spike on the Northern Pacific railroad was driven, and another overland line was completed. It is an event of much importance to the Pacific coast, as it promises that an era of competition in the overland traffic is to begin, and that another agency for the development of onr grand coast regions is to be put in active operation. The ceremonies of the completion of the road were of a very interesting character, and were witnessed by a distinguished throng of people from all parts of the United States, and from several countries of Europe. The scene where the last spike was driven is one of great heanty. It is in Montana, on the north side of Deer Lodge river, bordered with beantiful trees. On the south is a small plain, the whole surrouded with a perfect amphitheater of wooded hills. The site of the jnnction of the east and west lines is 1,198 miles from Lake Snperior, and 2,847 miles from Puget Sonnd. An address was made hy President Villard, who has carried the enterprise to its completion. William M. Evarts, the distinguished statesman and orator, also delivered a speech, eloquently reviewing the history of the great undertaking, and closing as follows:

This last achievement of the intelligence and energy of onr people climbs over the lofty range of mountains which divides the waters of a continent between the two great oceans of the world. It binds togetber by one more indissolnble bond the destinies of a great people who look from the windows of their habitation upon the horses of the sun as they rise from the stormy waves of the Atlantic, and again when they quench their fire in the smooth waters of the Pacific. It forms one more portage for the water-borne commerce which plies between Enrope and Asia. It brings new fields to tillage adequate to feed tens of millions, under whose healthy and happy toil their seed-time and harvest shall never fail, and tens of millions more, less fortunate, who crowd the workshops and the factories, the cities and the mines of Enrope and America in this age of indnstry. It will help to assuage inequalities of nature and disparities of fortune among onr own people, and to spread peace, plenty and prosperity to other nations. Nor does it lessen our gratitude and gratnlations that this is not the first, and that it will not be the last, that this wide land of onrs witnesses on the same great scale of effort and beneficence.

It is fonrteen years since the first great continental road was completed through the united efforts of the Union Pacific and the Central Pacific Companies. It was the great event of the times. Since that date the Southern Pacific Railroad has been practically completed from this city to New Orleans; and a second great line, known nnder varions names, but better as the Atlantic and Pacific, has been constructed as far as the Colorado river, there to connect with the now almost completed continental ronte. The Northern Pacific takes its place this day as the third great continental railroad. The fourth, when completed, will be the Atlantic and Pacific, either under that name or some other.

YOUNG, old, and middle-aged men and women get health and strength by using Brown's Iron Bitters.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of snbscription, and give it their own patronage, and, as far as practicable, aid in circulating the jonrnal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $4 a year, in advance. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times,) by turning a leaf.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions The pavilion has new varieties of performances. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

INFORMATION is wanted at this office of one Joseph Craig, formerly of Cass county, Illinois, who came to California in 1849.

REMITTANCES to this office should be made by postal order or registered letter, when practicable. Cost of postal order, for $15 or less, 10 cts.; for registered letter, in addition to regular postage (at 3 cts. per half ounce), 10 cts.

Successful Patent Solicitors.

As Dewey & Co. have been in the patent soliciting business on this coast now for eo many years, the firm' name is a well-known one. Another reason for its popularity is that a great proportion of the Pacific coast patents issued by the Government have been procured through their agency. They are, therefore, well and thoroughly posted on the needs of the progressive industrial classes of this coast. They are the best posted firm on what has been done in all branches of industry, and are able to judge of what is new and patentable. In this they have a great advantage, which is of practical dollar and cent value to their clients. That is this understood and appreciated is evidenced by the number of patents issued through their SCIENTIFIC PRESS Patent Agency (S. F.) from week to week and year to year

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Should this paper be received by any subscriber who does not want it, *or beyond the time they intend to pay for it*, let them not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favore. We intend to send none but worthy men.

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J. J. BARTELL—Yolo county.
E. P. BILLINGS—San Luis Obispo Co.
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Can change from solid stream to spray instantly Regular retail price $6. Weight, 4¼ lbs. Length, 32 inches.

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P. S.—A sample can be seen at this office

DEPARTMENT NO 9—PROBATE.—IN THE Superior Court in and for the City and County of San Francisco, State of California. In the matter of the estate of ROSEMOND GREENWOOD, deceased.

Notice is hereby given, that Friday, the 28th day of September, A. D. 1883, at 10 o'clock, A. M. of said day, and the court-room of said Court, at the New City Hall, in the City and County of San Francisco, State of California, have been appointed as the time and place for proving the Will of said Rosemond Greenwood, deceased, and for hearing the application of George Spaulding and Mary Williams for the issuance to them of Letters Testamentary.

Dated, August 29th, A. D. 1883.

[SEAL.] WILLIAM T. SESNON, Clerk.
By E. J. CASEY, Deputy Clerk.

EDWARD W. BLANEY, Attorney for Petitioners.

PRINTERS, AUTHORS, INVENTORS, PATENTEES, BUILDERS, MANUFACTURERS, MACHINISTS, MERCHANTS, and other trades-people can have satisfactory Engravings and Electrotypes made at moderate prices hy the S. F. ENGRAVING CO., No. 405 KEARNY ST. Send photographs, sketches, drawings, models or samples for estimates. Map and Woodcut Engravings enlarged or reduced by the aid of photography, at less than one-half the cost of the originals and in a short time. Photo-relief, Zincograph and other improved methods employed.

Cheap Ore Pulverizer.

There is for sale in this city, by I. A. Heald, American Machine and Model Works, 111 and 113 First St, a Rutherford Pulverizer, an improved revolving barrel crusher, which was only used a few times and is as good as new It will be sold very much below cost, and miners who are in need of such an appliance for a small mine will do well to make inquiries concerning it. It is suitable for a pulverizing mill for powder or other substances. Reference as to above can be had upon applying to this office.

The Lemmon Herbarium.

This Herbarium has been removed from the Blake House to a permanent place at 1205 Franklin St., near Fourteenth St., Oakland, one square east of the Post Office, where plants of the Pacific Coast, including Arizona, may be determined on application, and instruction given in botany during the winter. Sets or single specimens of the rare and new ferns of the Pacific Coast for sale.

Mining Books.

Orders for Mining and Scientific Books in general will be supplied through this office at published rates.

Mining Companies.

Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

Seaton Gold Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Drytown, Amador county, California.

NOTICE.—There are delinquent upon the following described stock, on account of Assessment No. 3, levied July 31, 1883, the several amounts set opposite the name of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Martin, A, Trustee	6	5,000	$400 00
Martin, A, Trustee	7	5,000	400 00
Martin, A, Trustee	8	5,000	400 00
Martin, A, Trustee	9	5,000	400 00
Martin, A, Trustee	10	1,000	80 00
Martin, A, Trustee	11	1,000	80 00
Martin, A, Trustee	12	1,000	80 00
Martin, A, Trustee	13	1,000	80 00
Martin, A, Trustee	14	1,000	80 00
Martin, A, Trustee	15	1,000	80 00
Martin, A, Trustee	16	1,000	80 00
Martin, A, Trustee	17	1,000	80 00
Martin, A, Trustee	18	1,000	80 00
Martin, A, Trustee	19	1,000	80 00
Martin, A, Trustee	20	500	40 00
Martin, A, Trustee	21	500	40 00
Martin, A, Trustee	22	500	40 00
Martin, A, Trustee	23	500	40 00
Martin, A, Trustee	24	500	40 00
Martin, A, Trustee	25	500	40 00
Martin, A, Trustee	26	500	40 00
Martin, A, Trustee	27	500	40 00
Martin, A, Trustee	28	500	40 00
Martin, A, Trustee	29	500	40 00
Martin, A, Trustee	30	4,000	320 00
Martin, A, Trustee	31	900	72 00
Martin, A, Trustee	33	5,000	400 00
Martin, A, Trustee	34	5,000	400 00
Martin, A, Trustee	35	5,000	400 00
Martin, A, Trustee	36	4,900	392 00
Martin, A, Trustee	38	5,000	400 00
Martin, A, Trustee	39	5,000	400 00
Martin, A, Trustee	40	5,000	400 00
Martin, A, Trustee	41	5,000	400 00
Martin, A, Trustee	42	5,000	400 00
Martin, A, Trustee	43	10,000	800 00

And in accordance with law and an order of the Board of Directors, made on the 31st day of July, 1883, so many shares of each parcel of said stock as may be necessary will be sold at public auction, at 528 California St., Room 6, San Francisco, Cal., on THURSDAY, the 27th day of September, 1883, at the hour of 1 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

A. MARTIN, Secretary.

OFFICE—Room 6, 528 California St., San Francisco, California.

September 5, 1883.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company.

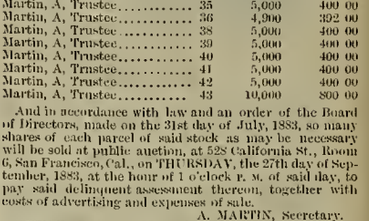
San Francisco, September 1, 1883.

At a meeting of the Board of Directors of the above named company held this day, Dividend No. 58, of twenty-five cents (25c.) per share, was declared, payable WEDNESDAY, September 12, 1883, at the Farmers' Loan and Trust Company, in New York, or at the office in this city.

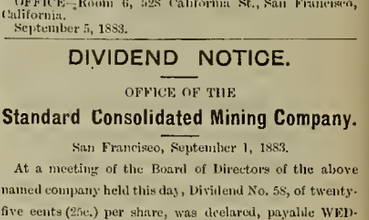
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News in Brief.

LORD WOLESLEY, the hero of the Egyptian campaign, is to be created a Field Marshal.

DIRECT cable communication has just been established between New York and Rio Janero.

THE largest cow in America weighs 3,200 pounds, and gives milk, in Chase county, Kansas.

CITIZENS of Massachusetts who plant four trees by the highway are allowed $1 abatement of their highway tax.

THE Canadian Government offers a bonus of £2 for every able-bodied white man who may settle in British Columbia.

A POSTAL money order connection between the United States and the Hawaiian islands goes into effect January 1st.

ALEXANDER, the colored cadet at West Point, is treated by the other cadets kindly, and no difference is made on account of his color.

A DISPATCH from Pensacola, dated the 10th, says all the patients in the Navy Yard and hospital are convalescent. There are no new cases.

A FORCE of 200 stone cutters, stone masons, laborers and machinists is now actively at work on the construction of the stone dry dock at Mare Island.

IN Alexandria there are still numerous attacks of cholera, but the average of daily deaths is reduced to four. The mortality in the provinces is also rapidly diminishing.

TWO COUGARS that have been the terror of sheepmen for some time in the neighborhood of Junction Bar, Oregon, were treed by a shepherd's dog and shot by a herder recently. They were males, and measured five feet eight inches from tip to tip.

THE general impression at Guaymas is that the disease which has made its appearance there, and is called "the tonto," was caused principally by the neglect of the city officials in not keeping the city clean. They trusted to the rainy season to do this for them, but the rain failed this year, and the rainy season seems to be over.

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, Sept. 13 1883.		
ANTIMONY Per pound	14 @	15
IRON American Pig, soft, ton	30 00 @	
Scotch Pig, ton	26 00 @	27 00
American White Pig, ton	@	
Oregon Pig, ton	@	
Clipper Gap, Nos. 1 to 4	32 50 @	35 60
Refined Bar	4 @	
Horseshoes, keg	5 50 @	
Nail Rod	7 @	
Norway, according to thickness	6 @	7
STEEL English Cast, lb	16 @	25
Black Diamond, ordinary sizes	14 @	
Drill	15 @	16
Machinery	12 @	14
COPPER Ingot	22 @	
Sheet	31 @	35
Sheeting, tinned, 14x18	22 @	23
Nails	17 @	
Bolt	31 @	
Oil	8 @	
Bar	@	
Cement, 100 fine	15 @	
LEAD Pig	4½ @	4¾
Bar	6 @	
Pipe	7 @	
Sheet	8 @	
Shot, discount 10 on 500 bags. Drop, ₱ bag	2 10 @	
Buck, ₱ bag	2 30 @	
Chilled, do	2 50 @	
TIN PLATES Charcoal	7 55 @	5 75
Coke	5 50 @	
Banca Tin	25 00 @	
Australian	25 00 @	
I. C. Charcoal Roofing, 14x20	6 50 @	6 80
ZINC By the cask	10 @	
Sheet, 7x3 ft. 7 to 10 lb. less the cask	90 @	
NAILS Assorted sizes	3 30 @	4 75
QUICKSILVER By the flask	34 00 @	35
Flasks, new	1 65 @	
Flasks, old	85 @	

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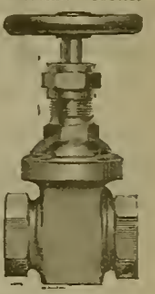
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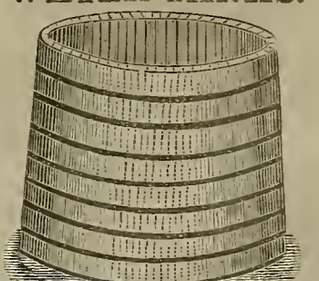
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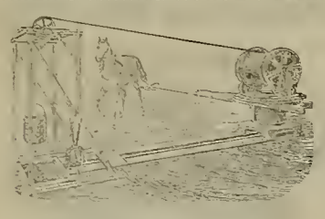
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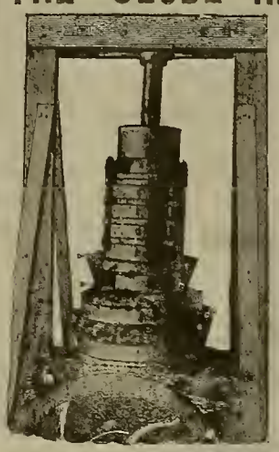
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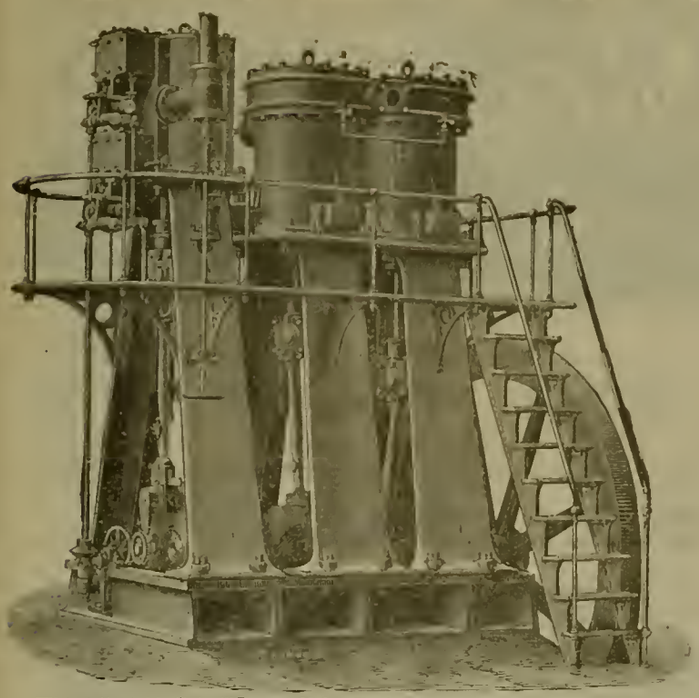
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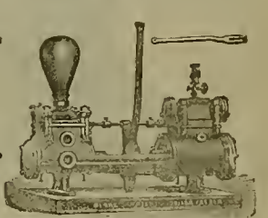


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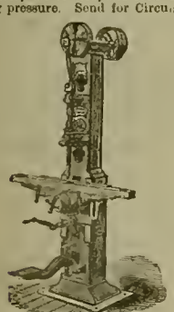
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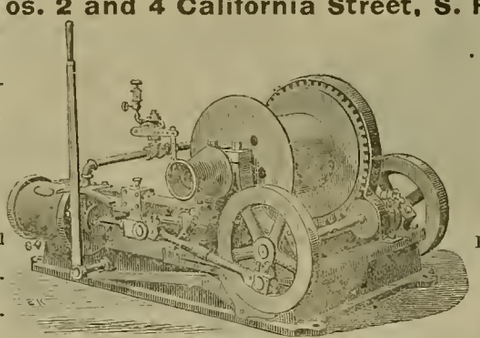


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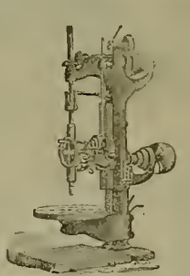




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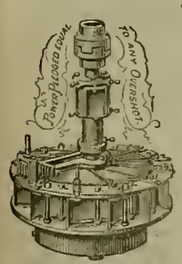
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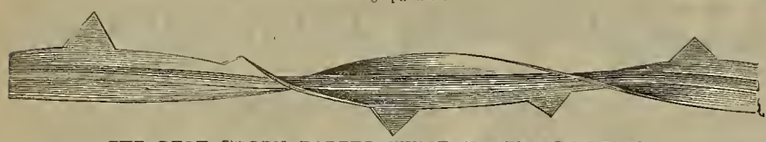
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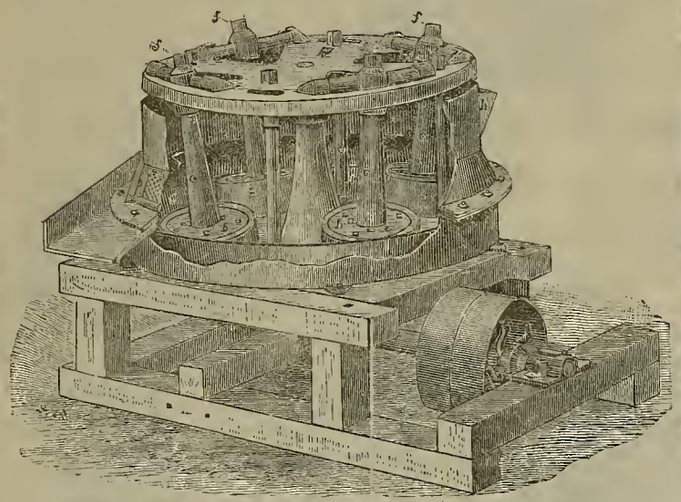
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MILLS ERECTED WITH ALL APPLIANCES COMPLETE.

After running one of these mills on the Whidden mine, in El Dorado county, over four months, and thoroughly testing its capacity and durability, I am prepared to offer it to the mining public, and claim for it the following advantages over the drop stamp mill:

1. The cost of same capacity is not more than one-half that of stamps.
2. Freight to mine one-fourth that of stamps.
3. Cost of erection at mine one-tenth that of stamps.
4. It runs with one-third the power per ton of ore crushed.
5. The wear is less than that of stamps.
6. The wearing parts are easily duplicated.
7. It has a much better discharge, and leaves the pulp in better condition for concentrating.
8. It is a better Amalgamator, saving fully nine-tenths of the gold in the mill; the balance can be saved on plates in the usual manner.
9. It is continually crushing; not like the stamp, using power to suspend it in air ninety-nine one-hundredths of the time, and the balance making a thundering noise, and accomplishing *comparatively* small results. It is as far in advance of the stamp mill as the present method of making flour with improved rolls is over the Indian's mode of crushing corn in a stone mortar.

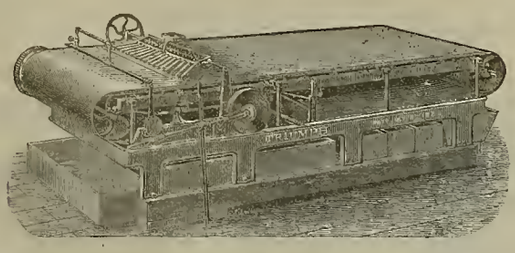
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The wear and tear is nominal, and the construction so simple that any miner can put it up and run it; and the low price brings it within the reach of all mill men, as it will save enough to pay for itself in any mill in a very short time. One machine will concentrate the tailings from a five-stamp battery.

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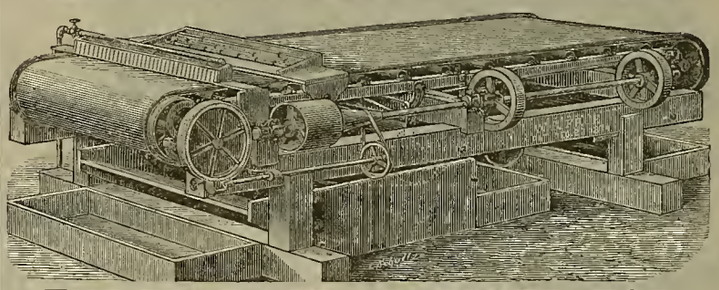
In presenting the above Improved Form of an Ore Concentrating Device to the mining public, we feel confident in our ability to supply the demand for a successful, practical-working machine.

One of them can be seen in operation, and we invite the attention of those interested to a critical examination of its merits, and will furnish prices at

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To those intending to manufacture or purchase the so-called "Triumph" Concentrator, we herewith state:

That legal advice has been given that *all shaking motion* applied to an *endless traveling* belt used for concentration of ores is an infringement on patents held and owned by the Frue Vanning Machine Company.
That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.
That the patent laws make *users* of infringements responsible as well as makers, and the public is therefore warned that there is considerable risk in purchasing any end-shake machine until our various patents have been decided.
That if there are those who for any reason prefer an end-shake machine, we can manufacture and sell to such machine of that description, as efficient as the Triumph, and at a lower price, and no liability for infringement will then be incurred by the purchaser.
That we shall protect ourselves against any one making, selling or using any machine infringing any of our patents. Patented July 9, 1867; May 4, 1869; Dec. 22, 1874; Sept. 2, 1879; April 27, 1880. Patents applied for.
That we are, and have been, ready at any time, to make a competitive trial against the Triumph, or any other machine, for stakes of $1,000.

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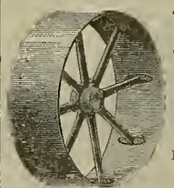
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SAN FRANCISCO, SATURDAY, SEPTEMBER 22, 1883.

VOLUME XLVII Number 12.

Water Wheel Experiments.

Trials with a Partial Turbine or Tangential Wheel.

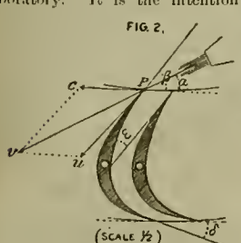
The following article gives the results of experiments with a partial turbine or tangential wheel, by J. Ahern, E. Louisson, J. Neuman and A. D. Schindler, of the class of '83, University of California, under the instruction of Prof. F. C. Hesse in hydraulics, and Ross E. Browne in construction. The matter is one of great interest to the mining community especially.

FIG. 1.



The water wheels which have attracted special interest in the mining regions of this coast are those designated for high heads and small supplies of water. Prominent among these are the Partial Turbines and the so-called Hurdy Gurdy wheels. These are usually fed with small conical nozzles, and it is for this condition of feed that the wheel built in our shop was designed. The water wheels, pressure gauge, etc., used in these experiments, are made a part of the permanent outfit of the Experimental Department of the Mechanical Laboratory. It is the intention to equip this department largely in such a manner as the example in this paper will suggest.

FIG. 2.



In shaping the buckets for full-running turbines, the direction of the discharge is insured by giving great length and little curvature to the discharge end of the bucket, and in fact, about the same form is used for partial turbines. In these, however, several buckets are covered at the same time by the jet, whereas, in our case not even one bucket is completely covered, and the problem is somewhat altered. If the bucket is shaped as shown in Fig. 1, when the jet is parted an important part of the water is "backed"—carried with the wheel, and subsequently discharged with nearly the full velocity of the bucket, and this of course entails great loss.

In designing a wheel to be run by a small jet, it is, therefore, very important to insure the proper direction of entrance of the water into the bucket; and if the bucket becomes too long, it may be shortened at the discharge end. This consideration has led us to the form of bucket adopted, and shown in Fig. 2.

FIG. 6.



$\alpha = 29°$, $\beta = 34\frac{1}{2}°$, $\delta = 20°$.

v—is the actual velocity of jet as discharged from the nozzle.

c—The velocity of point P of the bucket.

u—The velocity of the jet relatively to point P of the bucket.

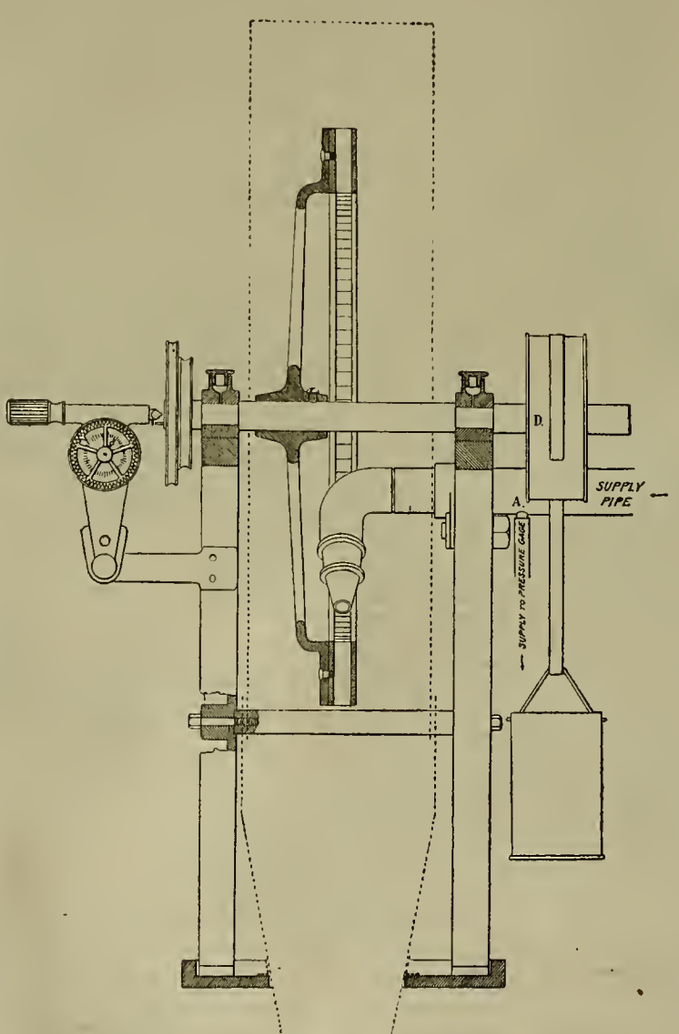
The greatest angle that any portion of the jet may make with the vane is ε in our case, equal to 30°. Of the water striking at such angle, the portion "backed" is $\frac{1}{2}(1-\cos\varepsilon)$, equal to 7 per cent.

The design was a part of the class-work in the construction-room, the wheel being built in the shop by Mr. Joseph Sladky. The details will be found in Figs. 3 and 4.

The dotted lines indicate a section through the cover.

The buckets may be readily removed and altered, or a new set substituted. The diameter of the wheel is 15½ inches. The head of supply water is from 50 to 60 feet. The width of buckets, 15-32 of an inch. The number of buckets, 90. The conical nozzle giving the best effect, ⅜ of an inch in diameter.

FIG. 4.



DETAILS OF PARTIAL TURBINE WHEEL.

The head of water was taken in the supply-pipe at point A (see Fig. 4), by means of the Hesse water-pressure gauge, which is illustrated in Fig. 5. In this gauge a small quantity of water passes through the minute opening O_2 into the glass bottle B, and discharges through O_1. The water mounts into the open glass tube, which has a properly graduated scale attached.

Designating by—

h_1 —The head of water in the tube above O_1.

h_2 —The head of supply water (hydraulic head) above O_1.

a_1 —The area of opening O_1.

a_2 —The area of opening O_2

Q—The quantity of water passing through the gauge.

c_1 —The coefficient of efflux for head h_1.

c_2 —The coefficient of efflux for $h_2 - h_1$.

g—The acceleration of gravity.

Then $Q = a_2\ c_2\ \sqrt{2g\,(h_2 - h_1)}$

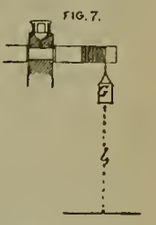
$$Q = a_1\ c_1\ \sqrt{2gh_1}$$

$$\frac{h_2}{h_1} = 1 + \left(\frac{a_2\ c_1}{a_2\ c_2}\right)^2$$

h_1 can be made any desired fraction of h_2 by simply regulating the areas of a_1 and a_2. The values of c_1 and c_2 will vary but slightly, excepting for very low heads; hence the scale is practically uniform. Our scale is graduated to tenths of a foot up to 60 feet, three points marked under known heads forming the basis of graduation.

The useful work was easily measured by swinging two weights connected by a cotton band over drum D (see Figs. 4 and 6). The weight G_1 was held to the floor, and the other weight (G_2) increased until the desired velocity of the wheel was reached. The weight G_1 was then released and augmented with shot until brought into equilibrium with G_2 + the force of friction between the band and the drum. At the same time, the number of revolutions per second (n) was observed with the ordinary speed indicator. (See Fig. 4.)

FIG. 7.



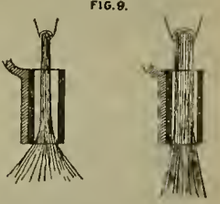
$G_1 - G_2$ is then the force in pounds on the circumference of the drum resisting motion of the wheel.

Let C_1 represent the circumference of the drum in feet, and L_1 the work done in foot pounds per second by the above force; then—

$$L_1 = (G_1 - G_2)\ C_1\ n.$$

However, since the work of the extra journal friction due to the weights G_1 and G_2 should not be charged as loss against the wheel; this was added to obtain the useful work.

FIG. 9.



Let φ represent the coefficient of journal friction.

Let C_2 represent the circumference of the journal in feet.

Let L represent the total useful work in foot lbs. per second.

Then $L = L_1 + \varphi\,(G_2 + G_1)\ C_2\ n$

$$L = n\,[C_1\,(G_1 - G_2) + \varphi\ C_2\,(G_1 + G_2)]$$

A simple experiment was made to determine the value of φ. A strong fine thread was wrapped around the shaft and a weight (G) attached (see Fig. 7.) This weight, being allowed to descend until it reaches the floor, does work in overcoming journal friction and giving kinetic energy to the wheel. This kinetic energy is subsequently converted into heat through journal friction as the wheel comes to rest.

Let l_1 represent the length of thread unwrapped during the descent of weight G.

Let t represent the time of descent of weight G.

FIG. 10



Let C_2 represent the circumference of the journal.

Let C_3 represent the circumference of the shaft.

Let $\mathfrak{G}$ represent the weight of wheel, shaft and pulley, the drum being removed.

Neglecting the unimportant influence of change of φ with increase of velocity, the work done by the weight will be:

$$G\left(1 - \frac{2l_1}{gt^2}\right) l_1$$

Let us designate this work by $G_3\ l_1$. When the wheel comes to rest this entire work will have been consumed in journal friction. The

(CONCLUDED ON PAGE 185.)

CORRESPONDENCE.

Gold Mining in Colombia.

EDITORS PRESS:—Noticing recently some articles in the PRESS on gold mining in the United States of Colombia, I thought of writing a few lines to show the California miners that this is not the only way mining is carried on here. "Diving for gold" in the State of Cauca is only heard of as carried on in the Choco, a few negroes doing this kind of work. Working river beds by using a stone to keep the miner at the bottom, I never heard of before. I wish the locality had been given. In this Department of Ambalemo, Estado de Tolimo, gravel mining is carried on by hydraulic process. The mines are extensive, and they have plenty of water. Most of the mines are in the hands of the English and native companies. The following is a list of the different mines which are at work or in shape for working, stating amount of water, etc.:

Mines.	Company.	Water, Miners' In.	Giants.	Nozzles, Inches.	Gravel.
Malpaso.....	English.	500 Each.	2	5	Hard blue.
Rio Sucio.....	English.	500	1	5	Soft red.
Cajongora.....	Native.	400	1	3 to 4	Soft red.
San Miguel.....	Native.	300	1	3	Soft red.
Campion.....	American.	250 Tank.	1	4	Soft red.
Tablazo.....	Native.	200 Tank.	1	3	Soft red.
San Indo.....	Native.	350	1	3	Hard on the bottom.
Mina Nene.....	Native.	250	1	3½	Hard on the bottom.
Mina Patilla.....	Native.	300	1	3	Soft red.
La Pava.....	English.	500	1	5	Soft red.
Orita.....	English.	2,000	2	5	Soft red.
La Reforma.....	Mr. Oakes.	300	1	3	Soft red.

The last three mentioned have machines and pipes on the ground ready for work. There are also the mines La Rica, Malabar, Tres Canoa, Palenge, Las Palmas, Gallnazo and Panuelos not at work. Other mines are worked by hand. Labor costs about seventy to eighty cents a day. CARLOS FAULHABER.

A Case in Point.

EDITORS PRESS:—I was somewhat amused by reading in a recent number of your paper an article headed "A Case in Point." Now the case in point means, if I understand it right, that our present processes for the recovery of the precious metals are behind the age. Now, I wish I could write newspaper articles, and I would astonish the world. I also wish I was a scientist, and I would soon be a millionaire. I watched the operations of harvesting a few weeks ago on one of our valley ranches, all the details of which were entirely new to me, but I was favorably impressed with the almost automatic performance of the various appliances, but could not fail to notice the loss of grain at each stage. I feel justified in stating that eighty per cent did not reach the grain sacks. I also visited the blacksmith shop in the same establishment, where the blacksmith was welding two pieces of iron together, and estimated that the amount of heat contained in the iron did not amount to one-tenth of one per cent of that evolved by the fuel used, and yet that wasteful method has been going on for centuries. That is a nut for Edison to crack. I visited our local foundry, and upon inquiry found that eighty per cent of the iron put into the cupola was considered a favorable yield of castings. And I have no idea that eighty per cent of the materials used by the wagonmaker enter into the finished wagon. I would also ask if ninety-eight per cent of the ink employed to print the MINING PRESS finds its way into its columns? And last, but not least, it grieves me that so much of one's toddy sticks to the glass when a friend feels generous enough to treat.

Now, Mr. Editor, I am of the opinion that the practical methods for the recovery of the precious metals are in advance of any branch of industry that I am acquainted with. For example, supposing a ton of lead ore to contain from three to four pennyweights of the metal, is there any metallurgical process in existence that would recover 80 per cent of it, leaving the important question of profit and loss entirely to one side?

Now, I want to know whether we have arrived at such a degree of perfection in the application of our old established methods as warrant throwing them all aside and looking in another direction for something better?

If you can cull an idea from the foregoing that you think would be any use to anybody you are welcome, and if not, please excuse me for troubling you. ARTHUR COOPER.

Greenville, Plumas county.

"Tools and the Man."

The following extracts are from an oration delivered at the opening of the Mechanics' Institute Industrial Exhibition in this city last week by Rev. Robert McKenzie:

Every throbbing cylinder, every revolving wheel, every sharp-edged instrument that moves in the fair, sings the words, "Tools and the man." In the one scene there we saw a beautiful tableau of what the world was; in the other we see an equally interesting tableau of what the world is. The one is the poetry of yesterday; the other the eloquence of to-day. This century is drawing to a close. It will soon be put on the shelf as you put your last year's ledgers. It will receive a label to mark it among all the others. How shall we label it? One age on that shelf is marked "Cæsar," another "Creeds," another "Crusades," another "Reformation," another "Revolution." Our age, I take it, will be labeled "Mechanics." For the railroad, the telegraph, the electric light, the hundred appliances for our homes and fields are the distinctive features of our century, and they are all the children of the mechanical spirit.

Wherein Mechanics Develop the Man.

We hear much of the power of metaphysics, or art, or the study of natural science to develop the man, together with an implication that mechanics have no such power.

A Rabbi was wont, on leaving the Academy, to pray thus: "I thank thee, O Lord, my God, that thou hast given me my portion among those who frequent the House of Instruction, and not among those who are busy at the street corners; I apply myself early to the Law, and they to vain things; I work and they work; I run and they run; I run after eternal life, and they run to the pit."

I take issue there, and claim that mechanics form a field in which a man may find room for full development, and in which he may find a path that leads to equal glory with the proud academician.

1. Mechanics develop the thinking faculties. I have a carpenter's bench near my study, to which I go when weary of theology or history, not for mental rest, but recreation; not for the cessation of thought, but for a change of thought. I find that at that bench it requires as much accurate and intense thought to miter a molding for an octagon or pentagon, as it does to find the five or eight leading thoughts in a text. I find that it requires the same logical acumen to put up an intricate piece of machinery, as it does to array my material into the form of an essay or a sermon. I grant you there are drudges at the bench that only carry out other men's thoughts, and perhaps we might find equal drudges at the student's desk. But some one had to think, and when a steam engine or a sewing machine is put up complete and ready for work it is as great a triumph of human intellect as an Illiad or a Paradise Lost. The new Brooklyn bridge, the latest triumph of mechanics, is a greater trophy of human intellect than an oration from Daniel Webster or a new volume of history from Bancroft. Moreover, the men who lead in the confessed field of intellect wait for the skill of the mechanic. The discovery of a star, the combinations of chemistry, the revelation of microscopy, all depend upon the deftness of some mechanic's hand and the genius of his brain. And the discoveries thus made are immediately seized by the mechanical spirit and turned into usefulness and profit for the world. There is not an ascertained fact in science, or discovery in geography or chemistry, or combination in art that is not woven by our mechanics into the fabrics exhibited in the Pavilion. The farmer, the weaver, the builder, the engineer, all hasten to apply the fruits of intellect to their labors.

The students of Socrates love to tell us that while a soldier, and hearing the morning call to arms, he hastened to dress himself; but while yet in the process of putting on a necessary garment some thought of lofty speculation arrested him, and there he stood for many hours, heedless of his garments, heedless of the tramp of soldiers and the din of war, lost in great thought. Over against that great intellect mechanics can place a hundred men who forgot to eat or sleep, who sat all oblivious to the surrounding circumstances, pursuing by intellect some new invention or

Improvement in Mechanics.

They develop the imagination. As you examine the implements of industry or the conveniences for home life in the fair, you will see that the study of inventors and manufacturers has been not only to make a thing strong and useful, but also to make it beautiful. All through that exhibition you will see the fruits of intelligence glorified by taste and imagination. The Greeks thought it a pity that any one should die not having seen the statue of Jupiter Olympus. I think, however, that you will search all galleries in vain for anything more beautiful, and majestic in its beauty, than a fast train sweeping around a curve, or a suspension bridge.

The Greek would pity us, never having seen the statue by his famous artist. We can well pity the Greek, never having seen this thing of strength, of usefulness, and yet that undulates and vibrates in its beauty, as if it felt its own worth, the work of our famous mechanics. For a long time the merely beautiful held the admiration of men; they did not ask, indeed they did not expect it to be useful. When Bacon came he turned the world away from the merely beautiful to the merely useful, and provided a thing was useful they did not ask or expect it to be beautiful; hence almost all the earlier inventions of the past 200 years were rude in their strength and unsightly in their usefulness.

Our Day Sees Mechanical Skill

Striving to unite these several qualities—usefulness and beauty. And has it not succeeded? The very carpets on your floors, the new papers on your wall, the furniture in your rooms, are models of usefulness and museums of art. You have but to look at any of our first-class merchants' wares in the fair to see that the mechanic has had a wide field and a deep inspiration for his imagination. It develops wealth. The ancient Jews had a wise proverb applied to all labor. "It is gold at bottom." Gold once followed only the sword. Those were days when men *carved* out their fortune. Days when the good old rule, the simple plan, "Let him take who has the power and keep who can," obtained among men. Much gold is no longer discovered by the sword. Commerce, buying and selling, was the next mine that produced the great fortunes. It made our merchant princes of the world's larger cities. That mine is still productive. Mechanics have opened another shaft to wealth, and among the millionaires of to-day are men who have reached their wealth by the invention or manufacture of machinery. There are mechanics commanding larger salaries to-day than are paid to the average man in the three professions.

The Field for Intellect.

The field for intellect and imagination in this direction is so comprehensive that it can employ the first grade of talent, and in the great manufacturing centers this first class talent receives as large a money compensation as if it were applied in the law or in medicine; and if there is anything in fame, that, too, can be reached by this path. Goethe, when about to pass away, regretted the prospect that lay before the men that were then young. It seemed to him that nothing great was left to be done. He thought all the great poems, dramas, problems, discoveries—all great and famous things, were reached, and it was left for coming men only to admire and imitate; and yet here lay a field, almost unknown in Goethe's day, in which men have made discoveries as great in fame as that of Columbus, and more in value to the human race than Goethe's own famous Faust—a field which is yet only partially explored; in which vast possibilities lie before every young mechanic, leading him to still more lasting fame.

It is but yesterday since, if a mechanic sought to rise to notice, he must leave his own work and enter another presumably higher class. Hugh Miller reached fame not by being a mason, but through the study of geology. A decided change has lately taken place. The upper classes that once looked for fame only in politics or the army or navy, are turning their attention to mechanics, and one titled man in England is never so happy as when driving a locomotive on the railroad.

At last the mechanic has lifted himself by lifting his work into prominence. He can now reach the top of manhood, not by passing to another sphere, but by excellence in his own. There are heights there from which he can look into the face of poet and scientist on a level with their own. Hugh Miller could now reach fame, not only as a geologist but as a mason.

Art Can Tell a Lie.

Yet sometimes finds its chief attraction in its lie. Theology can tell a lie and sometimes finds its popularity and its price in that lie. Natural science can tell a lie and sometimes founds its conclusions on that lie; but there are two things that cannot afford to tell a lie; these are mathematics and mechanics. The lie will out; will work speedy failure. A mechanic can put a lie into his work and have the painter hide it for a little time, but only for a little time. One mechanic was found making the hub of a wagon wheel out of a block of soft pine. When reminded that pine was not the true stuff for wagon wheels he said, "never mind, they won't know; it is going to be painted." He thought he hid his lie, but the first time the teamster turns his wagon out of a street car track, the paint will not be sufficient; the weak lie in the hub will become eloquent, and will damn the man who made it. A mechanic may be a liar and dishonorable, but he does not learn his infamy from his work; he dare not put his dishonor into his work. Your eyes will search all that is exhibited in this fair, and some eye will be keen enough to detect the lie put into any machine. Like the old knights he puts a check mark on the falsehood, and that lie condemns the machine.

Competition

In speed, in power, in accuracy of work is too sharp for this community to be indifferent to the character of each implement or production thus exhibited. Herod, in building the last temple in Jerusalem, employed 18,000 mechanics. The work was given out in piece work of so many ells. The ells were somewhat longer than usual, so as to avoid both the possibility and appearance of unfaithfulness in holy things, and thus because they were holy things, but all things are holy. The man framing a baby's cradle is building a temple, a temple where God and his angels are. The man building a ship is building a holy thing where property and lives and the fate of immortal souls may yet be decided; every link of anchor chain the blacksmith welds must be hammered with honor and truth, for yet the lee shore, the ruthless breakers and the howling night will test his work and search for a lie in it, and a hundred human lives will hang between life and death on the honor or dishonor that moved the arm of that plain mechanic at the anvil. The mechanic cannot afford to tell a lie.

Leadville Smelters.

Messrs. Eddy, James & Co. have succeeded in securing one-half the out-put of the Morning and Evening Star for the next six months. They continue to ship about 400 tons of ore per day to Denver, Pueblo and Omaha, and the steady drain is telling on the reserves of ore in Leadville. Next month, the Eilers furnace will be in blast, and Pueblo will then consume nearly as much ore as Denver. At the present time, the production of ore in this district, including Red Cliff, Ten Mile and Leadville, is probably something like 1,350 tons a day, and is not visibly increasing—at least in any marked degree. On the other hand the smelting capacity of the State is steadily on the increase. Within a few days the Elgin smelter has blown in. It is known that the Royal George smelter is preparing to double its capacity, and Mr. Eilers will add more stacks as soon as he can buy ore to keep them going. The situation points to a sharp struggle among the Leadville smelters for ore, if not for existence. If the valley smelters succeed in starving out the smelters in the mountains, they will have the miners at their mercy, and the latter, in self-protection, will have to do their own smelting. There is no reason in the world why such great mines as the Iron Silver, the Silver Cord and the Morning and Evening Star should not buy smelting establishments, or erect them, for the treatment of their own ores. The experiment did not succeed at the Little Chief or the Adlaide; but every one knows why it failed.

To smelt successfully, in competition with the great smelting establishments in this State, a man must know the business thoroughly, and must possess a high order of talent. But such men can be got. It seems curious that the railroads, by making so wide a difference between the freight on bullion and the freight on ore, should have discriminated against the mountains in favor of the valley. It might have been supposed that they would have seen their interest in the development of the mountain towns where their traffic originates. But they seem to have taken a different view. At the present time, and with the present tariffs, it is cheaper to send ore which runs 40 and 50 per cent in lead to Denver or Pueblo to be treated than it is to convert it into bullion at Leadville. The consequence is, that with the exception of the Morning Star ore, half of which goes to Cummings & Finn, and a few of the Red Cliff ores, which go to the American, nearly all the high lead ores are going to the valley, and the Leadville smelters are running on a percentage of lead which two years ago, would have been thought entirely inadequate. It will be curious to watch how the struggle progresses and where it ends.—*Ten Mile News.*

A New Coal Field.

A correspondent of the Chicago *Mining Review*, writing from Gunnison, Colorado, contributes the following concerning the coal fields of that country: The first "camp" at which I called was Crested Butte, a town of 1,300 inhabitants, situated at the terminus of the branch of the Denver and Rio Grande railway, connecting it with the town of Gunnison, some thirty miles to the south. Crested Butte may unquestionably be named the coal town of the Gunnison country, as its present, as well as future, depends almost entirely upon the development of the extensive bituminous and anthracite coal field by which it is surrounded.

About one mile to the west of the town the Colorado Coal and Iron Co. are now mining coal on quite a large scale, taking it to the town, where it is burned into coke. In prosecuting this work they now have fifty men employed and fifty coke ovens in operation. Their affairs at this place are under the management of J. K. Robinson. To the north of the town, and within a distance of five miles, there are immense anthracite coal beds, which are being steadily and gradually developed by the "Mesa Mining Company," under the management of Howard F. Smith, who has already expended large sums in development, as also in the erection of a number of buildings and a breaker. This company is now competing for the trade in the States and Territories west of Colorado. Their coal is a No. 1 article, and commands a high price.

The coal is of the bituminous variety, and has been proved by many practical tests to be of a very superior quality. It has been repeatedly used in stoves, fireplaces, grates, limekilns and blacksmiths' forges, and has been declared by all to burn freely, and blaze brightly, in short, has proved itself a first-class article of bituminous coal. It has been tried in steel manufacture, and been declared the very best coal for the purpose. Several carloads have been used in Colton, and invariably with the highest satisfaction. This promising property is owned by McIntosh & Cheney, who are steadily developing it.—*Colton Semi-Tropic.*

MECHANICAL PROGRESS.

The Testing of Locomotives.

The *Railway Review*, in a recent issue strongly urges the experimental testing of locomotives, and in view of the importance attached to the subject, the following, taken from our contemporary, may prove interesting:

The records of the test should include a detailed description of the locomotive and of the cars drawn, as regards type, dimensions and weights. The data of the trial paper should include the weight and temperature of feed, water, the weight and chemical composition of the fuel, the weight of ashes, the pressure and quality as to dryness of steam in boiler at different intervals, the temperature of the fire and up-take, the barometric pressure and humidity of the atmosphere. The pressures and temperatures, as well as the indicator cards, should be taken at regular intervals, as well as the number of strokes of the piston. Of course the position of the throttle and like particulars in regard to valves should be carefully noted.

When these data are all at hand it becomes no difficult matter to determine the actual performance of the locomotive—that is, to determine the pounds of steam and fuel consumed per horse-power per hour, and to ascribe the nature of the result to its true causes. The reason that it is necessary, besides knowing the weight of fuel, to know the weight of ashes and the chemical constitution of coal, and perhaps of the products of combustion as well, is that thus the engineer is enabled to learn whether the good or poor performance of the locomotive is attributable to the quality of the fuel, to the state of perfection or imperfection of the combustion, or to the design or proportions of the boiler, and thus to locate the cause of excellence or the reverse to some special feature of the boiler or of the fuel. It may, however, prove that all these conditions are normal and do not account for the special result achieved. The weight of steam, taken in connection with the records of the indicator card, then furnishes the clew.

It is necessary to know the quality of the steam, for the water feed to the boiler may be evaporated into dry steam, or the steam may be wet or superheated. If the steam is wet it should count against the boiler, if superheated in favor of it, and *vice versa*, in judging of the efficiency of the engine proper. The difference between the boiler pressure and initial pressure in cylinder, as shown by the indicator card, may prove an insufficient diameter of the supply pipe; an excessive fall of pressure at admission may prove insufficient port area for the special conditions of steam use, the cut-off may not be the most advantageous, nor may the cushioning, back pressure or initial pressure carried be the best. By taking the same locomotive and running it under different conditions of steam use and service, the effect of any one special condition can be determined, and that expressed in a percentage of efficiency or usefulness. Of course good judgment and sound engineering knowledge are essentials to arrive at correct conclusions, but without the records of such complete experimental trials, good judgment and sound engineering knowledge, as far as the economical use of steam in locomotives is concerned, are of comparatively little avail.

When no remedy is at hand, blind groping in the dark on chance of stricking the remedy is the result, and virtually the "apprentice" system of test is no test at all, and reveals nothing. Let us have a class of experimental testing of locomotives, which equals the best models of stationary practice, and let the test be undertaken, as important trials are in stationary practice, by specialists of undoubted ability and experience. Then will an improvement in locomotive practice be developed fully equal to such as have been already accomplished in stationary practice.

Testing Timber.

Besides straight and close grain, freedom from sap, shakes, and loose knots, says an exchange, good timber, such as the best deals, should have a uniform color throughout. Appearances of timber may mislead if they are not in accordance with well understood characteristics of soundness. In the same species of timber the strougest and most desirable specimens will be marked by narrow, regular, annular rings, indicating slow growth and close texture. The cellular tissue, as seen in the medullary rays, should also be firm and compact. Uniformity of substance is one of the chief characteristics of good timber; dead knots, flaws and shakes are of course prejudicial, and affect the strength. In sawn timber, the architect should see that the surface is not woolly, and that it does not clog the teeth of the saw. A bright silky luster ought to be apparent when planed, while a dull, chalky appearance, says one authority, is a sign of bad timber. When the annular rings are porous, the wood is weak. It has been remarked that good timber is sonorous when struck, while a dull, heavy sound betokens decay. Star-shakes, cup-shakes, or splits in the direction of the rays and rings, are to be avoided, especially heart-shakes, which prevent large scantling being cut. Good deals have a uniform color, and a darkness of tone is a sign of strength and durability. In best pine timber the annular rings are hard, of a dark-red color—but these vary in tint; the rings ought not to exceed one-tenth inch. Oak, if of the best kind, should have a pale, brownish-yellow color, with a perceptible shade of green, a firm and glossy surface, and hard and compact medullary rays. Another authority observes: "Bright-looking timber is better in quality than dull, and that which is smooth in the working better than the rough or woolly-surfaced; the heart of trees having the most sap wood is generally stronger and better in quality than the heart of trees of the same species that have little sap wood." No doubt the microscope affords a better test of good timber than the unaided eye. The use of the microscope in testing timber was noticed in a paper read at the Franklin Institute, Philadelphia, in which the author showed that timber condemned by that instrument cannot be mistaken, and after once seeing and comparing samples of good and bad wood, it is easy to recognize the difference with a pocket magnifying-glass. The micro-photographs of timber of different sorts have shown that in the strong kinds the concentric layers are close in texture and narrow in width, and the radial plates numerous, wide, long and stout; while in poor wood the opposite characteristics prevail. With such sections of timber of known strength, it would be easy to discard samples which did not exhibit the same number of rings or radial plates per inch of section.

Test of Straw Lumber.

Some straw lumber, accounts of which have within the past few months appeared in the technical press, was recently subjected to tests in Chicago, and, judging from the particulars now at hand, it would seem that the material, while possessing some very good qualities, still has not met all expectations. In this particular case, however, the unfavorable results of the experiments have, in a measure, been attributed to the fact that the material was not equal to some samples which have thus far been placed upon the market. When used as a ceiling the material was found to serve very well, but when used as a floor the results were apparently not at all encouraging. As described by one of our Western exchanges, it appears that in this case the lumber was laid as an experiment over another floor, the slabs being first treated to a peculiar solution. There was considerable trouble and expense attendant upon laying it, the slabs requiring to be placed and jointed very carefully. The material was found to be neither durable enough for this purpose nor devoid of warping tendencies. It was also readily attacked by heat and moisture, the results being occasional uneven patches of surface, blisters, etc., while some of the pieces warped to such an extent as to draw out the nails.

However, the possibilities respecting future results are still very great, and in course of time, when experience shall have demonstrated what can be done in that direction, it will not be strange if the process of making straw lumber, or some similar material, will have resolved itself into an unquestionable success. Probably the safest way of using the material now is to apply it to numerous smaller uses which will not require great strength or endurance. There are, in fact, a great variety of methods in which it can be successfully employed, and the mere fact of a few discouragements at the beginning does not do away with the probability that these difficulties may ultimately be conquered.

WEAR OF MILL ROLLS.—A prominent miller who has been using a large number of roller mills since they first came into use in this country, says the life of smooth roller journals is about four years, and of those on corrugated rolls from six to seven years. He says their breakage is caused by the constant jar to which they are subjected, which crystallizes the iron. The shorter life of the smooth roll necks is accounted for by their jumping motion under the high pressure under which they are run, which causes them to touch and fly apart as the feed varies, resulting in a constant vibration.

SOMETHING NEW IN STREET CARS.—On the Hamburg tramways a number of cars with flangeless wheels, much like omnibuses, and with turning gear, are working. To run on the line, these cars are fitted with a shaft in front of the front wheels, this shaft carrying on a lever a disk wheel, which the driver can lower into the tramrail groove as he requires, or raise it when it is necessary to get out of the way of obstructions. The arrangement works well, saves a lot of trouble, and the cars run easier than those with flanged wheels.

CAST IRON CHILLED TOOLS.—At a recent meeting of the Institution of Mechanical Engineers, in England, Mr. Fielding exhibited some cast iron chilled tools, and said that with chilled tools—the cost of which he showed to be merely nominal—he was able to turn cast and wrought iron and gun metal at from 50 to 100 per cent higher speed than with tools made from steel. He expressed surprise that such tools had not come into more general use.

SOFTENING CHILLED CASTINGS.—Heat the metal you wish to drill in the fire to a little above a cherry red. Then remove it from the fire and immediately place a lump of brimstone (sulphur) on the part to be drilled. You can keep the metal on the fire so as to retain heat and continue to throw sulphur on it until it will be as easy to drill as pot metal is.

SCIENTIFIC PROGRESS.

Some Undiscovered Truths in Geology.

At the recent meeting of the American Association, for the advancement of science, held in the city of Montreal, Canada, the President, Dr. J. W. Dawson, of Montreal, addressed the body on "Some Undiscovered Truths of Geology." It abounded in interesting thoughts, of which but an epitome can be given. His subject covered the whole history of the earth in all time, allying itself at the beginning with astronomy, physics and celestial chemistry; and dealing along its course with meteorology, geography and biology, and finally getting mixed with questions of archæology and anthropology. We copy the following synopsis of the doctor's address from the *Scientific American:*

In such a wide sweep we need not be surprised to learn that there are yet some unsolved problems. We are met at the outset with an inquiry as to man's place in the nature he is to study. His organism is certainly a part of nature, and he is the terminal link of a long chain of being. As a scientific animal, man finds within himself a mind more potent than matter, and that reacts on nature. We recognize this difficulty when we divide science into experimental and observational. It does little good to meet mysteries by guesses, nor should we on the other hand resign ourselves to ignorance. We must wrestle with the unsolved questions of nature, mastering what we can, and leaving others to be grappled with by our successors. In proceeding to mark out the limits of ascertained knowledge, the speaker began with the oldest rocks, a formation of immense thickness, and corresponding to what used to be called fundamental granite. He intimated his belief that this was deposited as gneiss from a shoreless ocean. The Lower Laurentian rocks probably limit our progress backward, beyond which lie only physical hypotheses as to a cooling incandescent globe. Ascending, we meet with significant changes. Beds of limestone are associated with the beds of gneiss. Gravel beds show the existence of shores; and graphite informs us of some sort of plant life, and iron ores of organic matters. In the Middle Laurentian appeared the *Eozoon Canadense*, probably the oldest form of life of which we have any knowledge. Metamorphism next came into play. Nothing in geology perishes. Heat may change clays into slates, and limestones into marbles; but nothing wholly disappears. A great battle rages over the genealogy of the rocks, the steps of which Dr. Dawson set forth, claiming that the sudden incoming of life in varied forms baffled biologists and furnished an unsolved problem. The theories of evolution are insufficient to account for it. The process still is as mysterious as ever, and a great gap is left in our accumulated knowledge.

Suppose that we start, however, with a number of organisms ready made; we ask, how can these have varied so as to give us new species? It is a singular allusion that variation may be boundless, aimless and fortuitous, and that development arises from spontaneous selection. Varieties must have causes, and the vast and orderly succession of nature must be regulated by fixed laws, only a few of which are yet known to us. One consideration showing how imperfect are our attempts to reach the true causes of genera and species, is the remarkable fixity of leading types. Trace certain forms of life along their own line through stupendous vicissitudes and across the ages, and you find them substantially unchanged. Examples are the foliage and fructification of mosses, the venation of wings of insects, the structure and form of snails; all of which were settled in the carboniferous age.

Huxley holds that there are but two possible alternatives as to the origin of species viz., 1. Mechanical construction, 2. Evolution. But we know that instead of two there are numerous possible methods, such as absolute creation, mediate creation, critical evolution, and gradual evolution. The origin of whales affords an example of the difficulties arising from referring existing forms to imaginary ancestors. Gaudry, though a strong evolutionist, candidly says, "We have questioned these strange and gigantic sovereigns of the tertiary oceans, and they leave us without a reply."

The periods of rapid introductions of new forms of life were not periods of struggle for existence, but of expansion; while the real periods of struggle were marked by depauperation and extinction.

Another unsolved problem is the inability of palæontology to fill the gaps in the chain of being. Many lines of being present a continuous chain. On the other hand, the abrupt and simultaneous appearance of new types in many specific and generic forms, over wide areas, obliges evolutionists to assume periods of exceptional activity alternating with stagnation—a doctrine scarcely differing from the old theory of special creation. Plainly a vast amount of conscientious work is needed to account for these breaks in the chain.

Another mystery yet unexplained is the cause of the great movements of the earth's crust by which mountains and plains and ocean beds have been formed. It is known, however, that much is due to the unequal settling of the earth toward its center, and also to the pressure of the ocean against the shore. Complex movements of plication are more easily comprehended than the regular pulsations of flat continental areas, each change being accompanied by changes of climate, plants, and animals.

The problems as to coal formations, the ancient fucoids or algæ, and as to the great and much debated glacial period, next received attention. What caused the great climatic changes that have occurred during geologic time? How came there to be a vast continental glacier reaching as far south as the 40th degree of latitude and thousands of feet thick? Shall we not after all have to give up this favorite theory? May not many of the phenomena be explained by supposing a glacial sea with Arctic currents and icebergs wafted southward more due to local glaciers? It may also be questioned if glaciers are not relatively protective rather than erosive agencies, and if sufficient importance has been attached to their work in leveling and filling old hills and channels. Still another question is as to how long a time has elapsed since the glacial era. Recently the opinion has been gaining ground that its cessation dates back only 6,000 or 7,000 years. This problem, of course carries with it the question of the origin and early history of man.

The practical inference is that we are but newcomers on this earth, and have had but little time to solve such great problems. Geology is young, scarcely a century old. We are surprised that so many regard it as a complete and full grown science. Humility, hard work, and abstinence from hasty generalizations should characterize geologists for at least a few generations to come. Science is light, and light is good. Let us raise it high enough to shine over every obstruction that casts any shadow on the true interests of humanity. Above all, let us hold up the light and not stand in it ourselves.

The Origin of Lightning.

In explaining satisfactorily the phenomenon of lightning, a difficulty is encountered in accounting for the enormous electric tensions, which are necessary to explain the great length of the spark often observed. The theory is advanced by A. Fick that the high tensions are produced by the sudden concentration of electricity already existing in a free state. This concentration is caused by the formation of large drops of rain from the small vesicles of moisture existing in the clouds, by which the surface upon which the electricity exists is greatly diminished. The sudden formation of drops of water from the mass of aqueous vapor may be due to the advance of cold air-currents. Mr. Fick endeavors to answer two objections which may be urged against this theory: 1. That in every rain storm lightning ought to be seen. 2. That it ought to rain whenever it lightens. To the first objection he replies that the drops may be formed gradually, and not suddenly, in which case the tensions would be dissipated gradually; and to the second, that drops are always formed in connection with lightning, but that in falling to the earth they sometimes encounter a layer of dry air, and are absorbed in their passage.

FILTERING DISTILLED WATER.—Herr Eiselt recommends the use of sponge for filtering distilled water. The filtration goes on with great rapidity, and the product is as clear as crystal. When filtered through paper, distilled water soon exhibits a sediment, which is never formed when filtered through sponge, so that the bottles scarcely need cleaning after several months' use. The apparatus that he employs consists of a bottle with an opening near the bottom, from which descends a bent glass tube. This tube is about six inches long and one inch and one and a half inches in diameter; at each end is a perforated rubber stopper, bearing a narrower glass tube. The wide tube contains one or two long strips of fine sponge that have been cleaned with dilute hydrochloric acid and then dried. The bottle to which this filter is attached must not be larger than the one placed beneath to catch the filtrate. The sponge, of course, must be cleaned every few months.

GOVERNMENT chemical laboratories exist in France for testing the qualities of food, wine and all articles of consumption and use that are subject to fraud and adulteration. The officials of these government laboratories are constantly employed in detecting adulterations. Deleterious adulterations of food and wine are destroyed. Other adulterations that merely affect the quality of the articles offered for sale and are not hurtful, except as frauds upon purchasers, are confiscated and sent to the hospitals. The laboratories belong to the police force of the government, and are designed to facilitate the detection and punishment of knaves. Our own government would do well to take some steps in this direction.

FLOWERS COLORED BY ABSORPTION.—At a late social entertainment, the Princess of Wales is said to have carried a bouquet of large lilies, tinted with delicate pink and blue by the absorption of dyes through the stems. The dyes do not in the least affect the perfume or freshness of the flowers. The process is the discovery of Mr. Nesbit. It is said flowers refuse to absorb certain colors. Some of the lilies which had been treated with purple dye separated the red from the blue, the colors being divided in the process of absorption.

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COMPANY.	LOCATION.	NO.	AMT. LEVIED.	DELINQ'ST.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alaska M Co	California..	3..	1 00..	Aug 22..	Sept 24....	Oct 13..	A Judson	320 Sansome st
Bodie Con M Co	California..	3..	50..	Aug 4..	Sept 10....	Oct 10	G W Sessons	309 Montgomery st
Best & Belcher M Co	Nevada..	27..	50.	Sept 18..	Oct 24....	Nov 16..	William Willis	309 Montgomery st
Con Amador M Co	Nevada..	6..	50..	Sept 15..	Oct 20....	Nov 13..	F B Latham	408 California st
Compo Seco Copper Co	California..	2..	10..	Aug 10..	Oct 1.....	Nov 20..	D Buck	309 Montgomery st
Chollar M Co	Nevada..	12..	1.00..	Aug 2..	Sept 6 ..	Sept 28..	W E Dean	309 Montgomery st
Bay S M Co	Nevada..	13..	30 .	Sept 7..	Oct 15....	Nov 12..	F M Hall	327 Pine st
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East Mt Diablo M Co	Nevada..	3..	05..	Aug 13	Sept 17 ..	Oct 8....	G W Fisher	306 Pine st
Entrnacht Gravel M Co	California..	13..	05..	Sept 11.	Oct 17 ...	Nov 5..	B Knux	209 Sansome st
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Equitable M Co	Utah..	28..	25..	July 24..	Aug 31....	Sept 28..	C A Collins	512 Montgomery st
Gorilla M & M Co	California..	2..	21..	Aug 23..	Oct 3....	Oct 31..	A A Enquist	436 Montgomery st
Hale & Norcross M Co	Nevada..	78..	50..	Sept 11..	Oct 16....	Nov 6..	J T Lightner	309 Montgomery st
Homer M & M Co	California..	3..	10..	Aug 2..	Sept 8....	Oct 2..	F E Luty	330 Pine st
Lima Con M Co	Arizona..	7..	05..	Aug 6..	Sept 10....	Oct 6..	R D Hopkins	436 Montgomery st
McClinton M Co	California..	9..	05..	Aug 30..	Oct 4....	Oct 24..	G W Sessions	309 Montgomery st
Mexican M Co	Nevada..	24..	1.00..	Sept 17..	Oct 23....	Nov 13..	L McCoy	309 Montgomery st
North Gould & Curry M Co	Nevada..	5..	25..	Aug 9..	Sept 11 ..	Oct 1....	O H Mason	331 Montgomery st
Pleasant Valley M Co	California..	2..	15..	Sept 8..	Oct 16....	Nov 3..	C E Elliott	327 Pine st
Potosi M Co	Nevada..	13..	50.	Aug 13.	Sept 17....	Oct 8	W E Dean	309 Montgomery st
Ruby Hill Gravel M Co	California..	9..	25..	Sept 3..	Oct 20	Nov 12..	H Pecham	320 Sansome st
Swansea M Co	California..	3..	25..	July 21..	Sept 1....	Sept 24..	M A Wheeler	119 Market st
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San Miguel & Trinidad M Co	Mexico..	3..	1.00..	Sept 8..	Oct 11....	Oct 19..	C G Brooks	210 Front st
Trinity C M Co	California..	1..	..	Sept 15..	Oct 22....	Nov 6..	L Wadham	528 California st
Tip Top M Co	Arizona..	7..	25..	Aug 16..	Sept 24....	Oct 22..	H Deas	309 Montgomery st
Virginia Con M Co	California..	10..	01..	July 24..	Sept 3....	Sept 24..	A F Benard	364 Howard st
Winthrop M Co	California..	1..	25..	Sept 17.	Oct 23....	Nov 16..	H Wright	410 Front st
Yaqui M Co	Mexico..	2..	10..	Sept 12..	Oct 17....	Nov 7..	T T Atkinson	337 Pine st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DAT
Belle Isle M Co	Nevada.	J W Pew	310 Pine st	Annual	Sept 27
Detroit Copper M Co		J Elbert	331 Montgomery st	Annual	Oct 1
Eureka M Co	Nevada.	A F Main	418 Jackson st	Annual	Sept 29
Mt Potosi Con M Co	Nevada.	J H Sayre	330 Pine st	Annual	
Mayflower Gravel M Co	California.	J Morizio	328 Montgomery st	Annual	Sept 29
Pasadena Valley M Co	Nevada.	W L Oliver	328 Montgomery st	Annual	Sept 25

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Bulwer Con M Co	California.	W Willis	309 Montgomery st	15	July 2
Kentuck M Co	Nevada.	J W Pew	310 Pine st	10	July 19
Mt Diablo M Co	Nevada.	R H Heath	318 Pine st	25	Sept 25
Standard Con M Co	California.	Wm Willis	309 Montgomery st	25	Sept 12
Silver King M Co	Arizona.	J Nash	315 California st	25	July 12

Table of Highest and Lowest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Aug. 29.		WEEK ENDING Sept. 5.		WEEK ENDING Sept 13.		WEEK ENDING Sept 20.	
Alpha	2.00	2.40	....	....	2 10	2.00	2 15	2.10	2.55
Alta	.60	1.05	.80	1.10	.85	1.50	1.00	1.50
Andes	.70	.85	.70	.75	.70	.75	.60	.70
Albion	....	.50	....	....	....	.40	....	.45
Argenta	.25	.55	.20	.30	....	.15	....	....
Atlas	....	....	....	....	....	....	....	....
Belcher	1.00	1.05	1.00	1.05	1 00	1.10	1.05	1.15
Belding	....	....	....	....	....	....	....	....
Best & Belcher	4.10	4.50	4.20	4.50	3.75	3.20	3.35	3.75
Bullion	1.10	1 20	1.00	1.10	.90	1.00	1.00	1.05
Bechtel	....	....	....	....	....	....	....	....
Belle Isle	.35	.40	....	.25	....	.35	....	.30
Bodie Con	....	.25	.15	.25	.15	.35	.15	.30
Benton	.15	.20	.20	.25	.20	.30	.20	.25
Bodie Tunnel	....	....	....	....	....	....	....	....
Caledonia	.20	.25	....	....	....	....	.20	.25
California	.30	.40	.30	.40	.20	.30	.10	.20
Challenge	....	....	....	....	....	.35	.25	.40
Chollar	3.10	3.30	2.70	3.20	2.00	3.10	2.75	3.15
Confidence	2.05	2.25	....	.35	1.90	2 00	....	1.85
Con. Imperial	....	....	....	....	....	.10	....	....
Con. Virginia	.55	.65	.65	.75	.55	.60	.45	.55
Crown Point	1.00	1.20	....	1.15	1.10	1.20	1.20	1.40
Day	....	....	....	....	....	.50	....	....
Elko Con	....	....	....	....	....	....	....	....
Eureka Con	6.00	6.25	6.75	7.25	67	71	6.00	7.00
Eureka Tunnel	....	....	....	....	....	....	....	.15
Exchequer	.55	.75	.60	.65	.55	.65	.60	.65
Grand Prize	....	.30	....	.25	....	.20	....	.10
Gould & Curry	2.85	3.35	3.10	3.25	2.40	3.05	2.30	2.75
Hale & Norcross	6.30	6.25	52	64	3.70	4.95	3.70	4.10
Holmes	....	....	....	....	....	....	....	....
Independence	.50	.55	....	....	....	....	....	....
Julia	....	.15	.05	.10	....	.10	....	....
Justice	.30	.35	.30	.40	.35	.65	.40	.50
Jackson	....	....	....	.50	....	....	....	....
Kentuck	....	....	....	....	....	....	....	....
Martin White	....	....	....	....	....	....	....	....
Mono	....	....	....	....	....	....	....	....
Mexican	3.35	3.80	3.65	3.85	3.45	3.40	2.50	3.20
Mt. Diablo	6.25	6.5	4.15	4.25	3.25	4.50	4.00	4.60
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	....	....	....	....	....	....	....	....
Northern Belle	62	62	....	64	6.00	6 75	6.00	.61
North Noonday	....	....	....	....	....	....	....	....
Navajo	2.60	3.20	2.95	3.00	2.80	2.90	....	2.60
North Belle Isle	....	.40	....	....	.55	.60	....	.45
Occidental	....	....	....	....	....	1.50	....	1 50
Ophir	3.05	3.95	3.05	4.00	3.45	3.70	3.30	3.70
Overman	.40	.45	....	....	....	.35	.40	.45
Oro	....	....	....	....	....	....	....	....
Potosi	1.15	1.30	1.05	1.20	.75	.90	1.05	1.20
Pinal Con	....	....	....	....	....	....	....	....
Savage	1.85	2.55	2.40	2.60	1.85	2.20	1.75	2.05
Seg. Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	4.2	4.70	3.75	4.30	3.10	3.95	3.50	4.15
Silver Hill	....	.10	....	.10	....	....	....	....
Silver King	6.50	7.00	7.00	8.00	....	8.00	.75	4.00
Scorpion	.55	.65	.60	.65	.55	.60	.60	.65
Tuscarora	....	....	....	....	....	....	....	....
Union Con	5¼	6 25	5¼	5¼	4.85	5¼	4.35	4.90
Utah	2.00	3.20	2.90	3.20	2.60	3.00	1.95	2.65
Ward	....	....	....	....	....	....	....	....
Wales	....	....	....	....	....	....	....	....
Yellow Jacket	3.05	3.55	3 05	3.25	3.15	3.35	3.10	3.30
	....	....	....	....	....	....	....	....

Sales at San Francisco Stock Exchange

THURSDAY A. M., Sept. 13.

100 Alta.....1.30@1.35
100 Alpha.....2.35
210 B. & Belcher.....3½@3.60
100 Belmont.....1.35
450 Belle Isle.....30c
540 Chollar.....2.95@3
700 Con. Virginia.....45@50c
1050 California.....15c
25 Crown Point.....1.30
60 Eureka Con.....6
305 Gould & Curry...2.45@2.5
100 Grand Prize.....15c
640 Hale & Nor.....4@4.05
250 Justice.....50c
375 Mexican.....2.55@2.65
100 Navajo.....2.65
200 Northern Belle.....62
200 Ophir.....3¼
50 Overman.....40c
125 Potosi.....1.15
350 Savage.....1.90@1.95
370 Sierra Nevada.....4@4.05
80 Utah.....2.15@2.20
520 Union.....4½
310 Yellow Jacket...3.20@3¼

AFTERNOON SESSION.

300 Alpha.....2.25
200 Benton.....25c
350 B. & Belcher...3.60@3.65
300 Belmont.....1.20
100 Bullion.....90
50 Belcher.....1 10
575 Belle Isle.....30c
500 Chollar.....3 05
700 Con. Virginia.....50c
100 Crown Point.....1.25
470 California.....15c
100 Eureka Tunnel.....15c
325 Gould & Curry..2.55@2 60
1860 Hale & Nor.....4 10@4 20
100 Mexican.....2.65
435 Ophir.....3.40@3.45
430 Potosi.....1.10
850 Savage.....1.90@1.95
880 Sierra Nevada.....@4.10
110 Utah.....2@2.05
100 Yellow Jacket.....3.20

THE first steel rail successfully made in this country, and which was rolled at Chicago, May 25, 1865, is said to have represented over $500,000 in experiments and outlays.

THE semi-annual statement of the Eureka Tunnel Mining Co. shows 1,425 tons ore smelted in the six months ending August 31st, the same yielding $52,114.

Mining Share Market.

A weak and sluggish market seems to be the rule of late. The miners are hard at work up on the Comstock, and hopefully advancing their drifts in various directions, but no bonanza has been uncovered for many a long month. The *Enterprise*, thinks that the outlook at the north end is good. More quartz is being found at and below the 3000 level of the Union than was encountered on any of the levels above, and all the quartz—even to the smallest stringers—is metal-bearing. This is a new and good feature. It shows strength and fertility. The Ophir folks are now opening out to the west on their 150 level by means of two-cross-drifts. In this old ground there is doubtless much ore that will pay very well for extraction and milling. The drifts will open the ground considerably below the point where milling ore is now being extracted from the old croppings. The winze in the Hale and Norcross is now near to the 2700 level. At this depth crosscuts will be run both east and west. Work on the 2700 level will be watched with great interest by all mining operators. The fact that the narrow streaks of ore in the winze have held out for a distance of over 100 ft gives assurance that the broader veins lying to the west have not deteriorated. At Gold Hill the Yellow Jacket, Crown Point and Belcher are still awaiting the starting up of the mills on the Carson river. Steam power is being placed in the Brunswick mill, therefore in the future there will not be a total cessation of ore extraction upon the failure of the water in the river.

Bullion Shipments.

Mt. Diablo, Sept. 10th, $6,549; Northern Belle, 10th, $3,658; Standard; 10th, $19,844; Bodie, 10th, $7,749; Ophir, 15th, $12,063; Contention, 14th, $19,043; Mt. Diablo, 13th, $4,803; Ontario, 14th, $12,459; Crescent, 14th, $4,930; Stormont, 14th, $2,585; Hanauer, 14th, $12,415; Crescent, 15th, $6,280; Hanauer, 15th, $5,000; Nevada, 15th, $900; Horn Silver, 15th, $33,000; Vienna, 15th, $2,670; Horn Silver, 17th, $15,000; Ontario, 16th, $8,026. During the week ending Sept. 15, there were shipped from this city 55 cars of bullion, 1,353,604 pounds, sent East; eight cars ore, 225,390 pounds, sent West; two cars ore, 65,800 pounds, sent East, and one car white lead, 23,000 pounds, sent West; making a grand total of 66 cars, aggregating 1,667,794 pounds.

THE first train on the California Southern railroad for San Diego left the depot at San Bernardino on the 13th inst. The engine was nicely decorated with evergreens, flowers, corn, pumpkins, alfalfa, grapes and a keg of artesian water, while the inside of the engine was decorated with bouquets of flowers.

ANOTHER process of impregnating wood for its preservation has been patented in Germany. This consists in first treating the wood with a solution of zinc vitriol, and then with a solution of chloride of calcium, so that the preservative coating is formed upon the wood by the chemical action of both substances upon one another.

LORD DERBY says the Governments of Great Britain and Germany made treaties with Samoa, which, therefore, forms an independent State, and its annexation to Austria might lead to a violation of international law. The same, he declares, to be true of the other islands.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

MAMMOTH.—*Dispatch*, Sept. 15: One of the richest strikes known in the mining history of California was made at the Nevills, or Mammoth mine, three miles south of this place, last Saturday. A pocket of quartz of almost unparalleled richness was found less than 100 ft from the surface, in which was contained from $75,000 to $100,000, and about two tons in quantity. Much of this might be termed chunks of gold instead of gold bearing quartz. Some of these pieces of solid gold were about as heavy as a man could lift from the ground. The largest piece was an oval 16 by 22 inches and 6 or 7 inches thick. This gold is almost black and of the same character as the former rich strikes found in the same mine. We have no doubt that this is the richest find of gold ever known in the United States at one time. The *Ledger* of Sept. 15 says of this wonderful strike: It completely throws into the shade anything in the history of mining in Amador county, if not in the State. During Friday, a ton of this gold-freighted metal was taken out. It is not so rich as the gold streak taken out some time ago, but there is vastly more of it. The value of this bonanza is estimated at from $50,000 to $100,000. The ledge is five ft wide, and the whole face of it was held together as it were by spikes of solid gold. Altogether, 3,000 pounds have been taken from this bunch of ore, and the end is not yet. The very rich streak, from which this mass of free gold has been taken, ranges from an inch or so up to 20 inches in width. The previous seam varied from the thickness of a knife blade to three inches.

ZEILE MINE.—In the Mint Director's report of this year is the following: The rock is low grade, and assorted in the mine; the best is sent to the mill, the balance thrown aside in the drifts. It is by a careful system of working that the mine is made to pay. The rock only pays $2 per ton in free gold and $5 to $6 per ton in sulphurets, which brings the yield up to a fair average. Attached to the mine are chlorination works, which are kept running day and night, working from 4 to 5 tons of sulphurets every twenty-four hours, yielding large returns.

NOTES.—The clean-up at the Oneida mill running on rock from the Jackson mine, was completed last week. The bullion was taken below, and the men hearing this at once quit work. Nothing is doing at present. The water in the Amador canal is so low that some of the mines are put on short allowance. The Bunker Hill mill has been idle most of the week for want of water. The Keystone mill has been run part of the time by steam for the same reason. Nothing is doing on the Wabash mine. The rich strike lately made has brought one or two adverse claimants to the front.

VOLCANO.—*Dispatch*, Sept. 15: Rich rock is being taken out of Downs mine. Also at the Modoc, on Pioneer creek. Jake Griesback is getting out some very rich rock. It is rumored that the Hadley mine will start up soon. The engine has been repaired.

Calaveras.

INVINCIBLE.—*Mountain Echo*, Sept. 12: The Invincible is making a splendid showing. The vein in the drift now being driven north, is about 9 ft wide, and competent judges say the ore will mill from $30 to $40 per ton. The shaft is about a hundred ft deep.

GOLD HILL.—The Gold Hill mine, on Smith's Flat, owned by George Osborn and Son, is on the west side of a hill 300 or 400 ft in length, and a hundred and fifty ft in height. The mine is opened by a tunnel, for about 200 ft. Rich deposits have been found at intervals for nearly the entire length of the tunnel. While at the mine, we saw them dig out and wash two pans of quartz and fine dirt, which must have contained at least $700, and we were informed that Friday and Saturday, they had extracted from the same place, over $1,300.

MURPHY'S.—*Citizen*, Sept. 15: Sublett & Dodge are at work in the O. K. making preparations to sink deeper on the coarse gold claims, where a year ago they pounded out $50 a day in a hand mortar. In the Red Wing a fine body of rich ore is found at the 100 level, 5 ft wide.

El Dorado.

HENDY MINE.—*Democrat*, Sept. 15: Wm. D. Edwards of the above mine at Nashville, was in town Tuesday, and says they are ready to commence sinking again, having got the mine cleared of water and in tip-top shape. The mill will be started up as soon as sufficient water can be had to operate it. The fine hoisting works put up a few months ago, and which are operated by both water and steam, work to perfection.

Inyo.

MODOCK.—Inyo *Independent*, Sept. 15: Mr. J. J. Gunn, who arrived yesterday from Darwin, reports that Supt. Fitzgerald has made a new strike in the Modock mine, belonging to the company series. It has been opening out well for the past five or six days, and consists of fine 150-ounce silver-lead ore. The furnaces will be started up in about ten days.

STATE RANGE.—M. E. Harmon has been appointed superintendent of the new mines and mill at Reilly, belonging to the Argus Range S. M. Co. It is to be hoped that the company have squared up their financial matters, and if so, Harmon will make an entire success. The mines are very large and rich; the big mill is first-class in every respect, and ready for operations when the builders are paid for it.

Mono.

STANDARD CON.—Bodie *Free Press*, Sept. 12: During the week ending Sept. 8th there were shipped to the mills 1343 tons of ore. The bullion shipment was valued at $19,843.99. The east crosscut, 1200-foot level, was advanced 11 feet; total length 52 feet.

BODIE CON.—During the week 137.485 tons of ore were sent to the mill and 156,025 tons were crushed. The average assay value of the pulp was $21.83 per ton; that of the tailings was $4.27 per ton. The bullion shipment was valued at $7,740.10.

BULWER CON.—The west crosscut from the north drift is in 448 feet. The ground is hard. The south drift from the west crosscut, 500-foot level, was advanced 14 feet during the week; total length 256 feet. The vein is 2 feet wide.

BODIE TUNNEL.—The west crosscut on the 250-foot level was extended 13 feet during the week. The south drift on the 200-foot level was lengthened 9 feet. The assays are higher and the ledge is widening out.

NORTHERN BELLE.—Bodie *Free Press*, Sept. 16: The outturn of the mine for the last fiscal year was 19,574 tons of ore, all of which was milled, together with 504 tons previously mined, yielding $763,930, or $38 per ton. In addition, 5632 tons of ore from the Mt. Diablo was put through one of the mills. Both mills are in good condition. These mills, with the improvements and furnaces, are valued at $358,650, and the hoisting works, etc., at $25,000.

MAY LUNDY.—Homer *Index*, Sept. 15: On the 120-foot level a drift, now 60 north, is in ore that pays under the stamps from $05 to $75 to the ton. About 240 feet further in, or 490 feet from the mouth of the lower tunnel, winze No. 2 was started and is now down 64 feet, following the vein all the way down in good ore. An inspection of this mine will convince any one that the May Lundy is soon to take rank as one of the largest, as of the richest, gold mines.

Mariposa.

BUENA VISTA MINE.—*Herald*, Sept. 14: The work done by the O'Gorman brothers consists of a shaft, located about 60 ft from the old Phebey shaft, which they have sunk to a depth of 82 ft; 25 ft from the surface they struck the lead solid, and still had it when they quit sinking. Not having anything but a windless and bucket to hoist with, a drift was commenced at the new shaft to connect with the Washington tunnel or the east side, and is now in 40 ft. This will ventilate the mine. The work so far shows a vein 8 ft wide, with 4 ft of paying ore, that assays from $30 to $60 per ton.

Nevada.

NOTES. Grass Valley *Tidings*, Sept. 12: Forman Stokes, of the Empire, informs us that the mine is in tip-top condition, that the ore coming out is good and there is enough in sight to insure a long and prosperous career for that oldest mine in the district. The 1200 level at the Idaho is looking first-class. The Magenta Co. are erecting pumping and hoisting machinery. The Mascotte, owned by Charles Robinson and Geo. Murphy, is working night and day, and indications show that a big ledge of quartz is close at hand. The ore improves materially as depth is attained. The Mascotte is suppose to be a continuation of the old Eureka ledge. The water is pumped out of the Imperial mine, and a contract was let to-day for sinking the shaft. The Grey Hound Co. are pushing their tunnel and have a good deal of rock on the dump. Work is going steadily ahead at the Maryland. The New York Hill Co. are driving their drift, and the mine is holding its own. It is stated that the East Eureka (O'Conner) will start up soon. The Powning Co. are down 40 ft and have found new ledge matter, and they expect that 20 ft deeper will disclose the main ledge. Work at the Greeley and Blackman mine is going ahead.

Plumas.

RICH GULCH.—Quincy *National*, Sept. 15: The Hallstead Co. are starting a tunnel to tap their ledge 200 ft deep. Several experts have visited the mine during the past week, and speak highly of it. It is sure that Rich gulch will make a lively quartz mining town.

GOOD CLAIM.—Johnny Riddell tells us that his prospects for a first-class hydraulic mine at Soda Bar are splendid. He had some beautiful gold to show for his work lately.

San Bernardino.

BONANZA KING CON.—Cor. Calico *Print*, Sept. 15: The center of the mine is simply immense. Fourth intermediate is opened 125 ft in the finest ore body I ever saw. In this drift and winze I can show any man $200,000. I can take out $10,000 a day with 8 or 10 men. The dumps contain half a million dollars. The ore house at mine, the ore bin at mill are all full. The mill run but 20¾ days for August, produced $44,500. The mill is now producing $2,180 per day. Ten stamps, dry crushing—a record never equaled anywhere. Total product for year so far is $444,820. I predict three-fourths of a million for 1883.

EXCHEQUER DISTRICT.—From Higgins & Co.'s claim some very fine ore has been taken and from assays made they claim to have three tons of ore out that will average $600 a ton. The float which led to the discovery of these mines assayed, from reliable authorities, $5,665.50 per ton. Parties are coming in here from all directions. New locations are made every day and everybody thinks he had struck it rich. The croppings show up well and there will be developments made that will astonish you as soon as facilities are obtained to go on with the work of prospecting.

Sierra.

GIBSONVILLE.—Downieville *Tribune*, Sept. 13 The existence of a back gravel channel was demonstrated by the Bootjack claim. This company after working out their front ground pushed ahead the main tunnel until a back channel was reached, where splendid paying gravel was found. The tunnel proved to be a little high, however. To successfully work the mine a tunnel lower than the present one will have to be run. This work, it is estimated, would cost $100,000. The Union Co., at Mount Pleasant, are now encountering the same difficulty. Lately they struck the back channel and found the tunnel two high. At present they are working through an incline. The gravel is very rich, but the company keep pumps running constantly. The Pilot Peak Co. are running for the same lead. They have already run a tunnel into the ridge over 3,000 ft., through hard rock. Five or six hundred ft further will carry the tunnel into the center of the ridge and on a line with the channel. But owing to lack of capital, they are at present at a standstill.

FOREST CITY.—One hundred and eleven ounces of gold was taken out of the South Fork mine, at Forest City, last week by the Bald Mountain Extension Company.

NOTES.—*Messenger*, Sept. 15: The Home Stake Co. are raising for gravel. They will have to go up 15 or 20 ft before reaching the pay lead. At Red Oak gravel mine, adjoining the Grand Prize, the tunnel is in 146 ft, through blue slate that blasts well. John Mason, superintendent. The differences be-

tween the Ruby Co. and Mr. Kennedy have been settled.

Tuolumne

SOULSBYVILLE. *Independent* Sept. 15. The new hoisting works on the Lamphier mine will be completed in one week. Mr. Kirkwood of Soulsbyville is putting up the engine. Capt. Bolter and James Pooley have a mine below town. Some gold can be seen in the rock and some looks splendid. Many expect the mine will soon be sold for several thousand dollars. They have a shaft started and one to the great depth of ten feet, more or less. The Soulsby mine is looking better than for months past. They are taking splendid rock from the levels. It is reported that the Louisiana mine has shut down, and the Supt. is putting in condition the Sulphuret works at Soulsbyville preparatory to working material from the Black Oak and other mines.

RISING SUN. *Sonora Democrat*, Sept. 15: Chas. Lang and Capt. Woodworth have ordered the machinery for a five stamp mill, to be erected on the Rising Sun mine, at Cherokee, and it is expected to have the mill ready for operation about the 20th of October.

RIVER MINING.—L. J. Lewis has several gangs of men at work in a race on the Stanislaus river, below Robinson's ferry, setting sluices and pumping with two Large Chinese pumps, run by an overshot wheel 16 ft in diameter, and otherwise getting ready to work a large section of the river.

Trinity

BLAKEMORE. —*Journal*, Sept. 15. From T. J. Blakemore, who was in town last week, we learned that they went down on the ledge a distance of 60 ft, and at that depth the ledge showed 6 ft wide. The rock is variously estimated at from $50 to $150 to the ton and those who should be good judges say it will average $100.

BULLYHOOP.—The ledge in the Bullyhoop shaft is now four ft in width, showing free gold all through one foot of the thickness being very rich. They are still sinking on it with every indication favorable.

EAST FORK QUARTZ.—Moor, Day & Hubbard have the ditch to their arastra completed and will soon commence crushing. The rock is very rich. We hear that Jas. Kelley found a very promising new lode in Deadwood last week, and another party discovered some rich veins of quartz on Rush creek.

NEVADA.

Washoe District.

HALE AND NORCROSS. *Enterprise*, Sept. 15: The enlarging on the branch drift to the winze on the 2600 level not only helps the ventilation, but also gives more room for working. The winze is down 110 ft on the stope, and the ore streaks hold out in width and strength. They will soon reach the 2700 level, when crosscutting will be run both east and west.

UNION CON.—The south drift on the 3000 level is cutting through streaks of metal-bearing quartz. The joint Sierra Nevada winze below the 3000 level is down 70 ft. The indications here, as well as on the west side, are that the vein is straightening up.

SIERRA NEVADA.—The main north drift on the 2600 level is pushed ahead rapidly. It will open up a large area of ground. On the 3000 level the joint Union Con. winze is down 70 ft.

MEXICAN. The ground at the top of the upraise from the 2900 level is still very hard and progress slow, as the workmen are much discommoded by the hot water that falls from over head. The winze down from the 2700 level, which this raise is to meet, is draining out very slowly.

GOULD AND CURRY.—Good headway is making in east crosscut No. 3, which now seems to be entering upon the edge of the large vein of quartz cut across in crosscut No. 2. It is thought that this vein will be found wider and stronger in going south.

NORTH GOULD AND CURRY.—Sinking is progressing favorably in vein porphyry which shows streaks of clay and stringers of quartz.

ALTA.—Excellent progress is making in draining the mine. They will in a few days have the 1450 level drained, which will leave but 700 ft to be pumped out.

IMPERIAL. The work of putting in order the hoisting machinery progresses well.

BELCHER.—The ore dumps are all full, and are awaiting the starting up of the mills on the Carson river, which, it is now said, will be in about two weeks.

SCORPION.—The west crosscut on the 500 level is passing through ground that shows occassional streaks of clay and quartz. Some water is encountered.

YELLOW JACKET.—About the only work being done at present is on the Sagebrush level, whence some ore is being extracted.

OPHIR. On the 150 level good progress is making in the two west drifts. A considerable amount of ore is being extracted from the croppings.

CON. VIRGINIA.—The usual progress is making in the south drift on the 2700 level. A chamber is being cut for No. 2 winze joint with California.

ANDES.—The west drift is still finding quartz of a promising character.

CROWN POINT.—Active mining will be resumed in two or three weeks, or as soon as the river mills can receive and reduce the ore.

SAVAGE.—Work will probably soon be resumed in the drift on the 2600 level.

CHOLLAR.—Prospecting will not be resumed until the new hydraulic pump goes into operation.

CALIFORNIA.—A chamber is being cut out for winze No. 2, joint with Con Virginia.

SOLID SILVER.—Are clearing away debris and putting in shape the mouth of the tunnel.

BEST AND BELCHER.—The north drift on the 2500 level is still being allowed to drain out.

UNION SHAFT.—Are still cutting out behind and easing timbers at the 2300.

OVERMAN.—Some ore is being extracted from the old upper levels.

UTAH.—Are advancing the north drift on the 1300 level.

Belmont District.

NOTES.—*Courier*, Sept. 8: Work progresses finely in the Jefferson mines, and the mill is still running. The Tybo mill is running constantly and is producing very fine bullion. Good ore is extracted daily from the Belmont mine.

Limestone District.

A NEW CAMP.—*Silver State*, Sept. 10: Very favorable reports are received from Limestone district, which is a new camp south of Beowawe. A Philadelphia company have let a contract to sink a shaft 100 feet deep on an extension of the Limestone No. 1, which is owned principally by railroad men. The original location on the Limestone lead has been prospected to a depth of 100 feet by a shaft. The lead shows ten inches of galena ore that assays over $100 to the ton in silver and carries 60 per cent of lead from the sagebrush roots down. In sinking the shaft some 25 tons of ore was extracted that will pay the expenses incurred in prospecting the mine. Limestone district adjoins Bullion, where a new ten-stamp mill and smelters are being erected.

Pinto District.

SILVERADO.—Eureka *Sentinel*, Sept. 11: We have it upon reliable authority, that on the 400 level of the Silverado Co.'s mine there are fine seams, which give promise of leading to bodies of good pay ore. A shipment of 120 tons of $100 ore was made to Eureka yesterday. The mine is worked on the principle that it must pay its own expenses. The Fair Play is looking better than ever. The recent strike is showing up richer all the time. The working force was yesterday increased to nine men. The Queen mine is not panning out very big just now, but the Jones brothers are following good indications and sanguine of striking it rich again.

Ploche District.

EL DORADO NEWS. *Record*, Sept. 8: From Andy Fife, who arrived from El Dorado canyon on Tuesday, we gather the following: The Southwestern Co.'s mill is running, and will continue to run all next winter, as they have enough ore to keep them a going. The Co. has made a contract with Fife to furnish them with 1,000 cords of wood. The chloriders, owing to the hot weather, have all quit work for some time and are rusticating at the Vegas ranch, having a jolly time drinking wine. Tons and tons of peaches are going to rot at the ranch. The ground is covered with them.

BULLIONVILLE.—The Smelting Co., after a month's trial, have found it impossible to work a portion of the Day ore, and have abandoned the project. The ore contains a large percentage of white iron, which forms a mush in the furnace that has to be raked out repeatedly, as no flux will reduce it to a slag state. Poujade had thirteen tons of ore worked at the furnace during the week that sampled over $200 per ton.

White Pine District.

HAMILTON.—*News*, Sept. 8: There is a prospect of some work being done this fall near what was once known as Carbonate City, 1½ miles above Swansea. Should there be furnaces again built here, there is reason to believe this will become one of the most promising parts of this district. Among the mines there are the Miser's Dream, owned by Mau, Heitman and Stede; the Mother Lodge and the Rocco, owned by Rocco Kraniaz. Rocco has done considerable labor this summer on the mines owned by him, and they present a marked improvement.

A NICE LITTLE MINE.—Fred. Gotchett showed us a few days ago two beautiful specimens of gold quartz, taken from his mine in Granite district, just across the range from Burgett's. They were literally lousy with gold, and a ton of such ore would make a man rich. Mr. Gotchett has a small two-stamp mill in Telegraph canyon. When he gets out a little fore he crushes it himself, and thus manages to make both ends meet.

ARIZONA.

DOSORIS.—Prescott *Miner*, Sept. 7: Mr. P. C. Craigue, of this property, informs the *Miner* that he is finding good ore in the bottom of a shaft down nearly 300 ft. The mine is pretty thoroughly prospected. Thus far the mine has shown mineral all through and the proceeds have paid all expenses.

COCHISE COUNTY.—Prescott *Miner*, Sept. 8: The smelting people refuse to handle ores which yield less than $100 per ton.

MARICOPA.—The Vulture has yielded wagon loads of gold. A large mill is in operation. The ore is not so rich as formerly and it is nip and tuck to make it pay.

YAVAPAI.—We now have the United Verde Co.'s 30 ton smelter running out a great deal of silver and copper, the Howell Reduction Works making bullion by the ton, and the Black Warrior mill. The Peck mill will soon be started.

PIMA.—Pima county has five out of a hundred stamps running. She is going to try smelters. The Copper Queen mine, Bisbee, has paid $900,000 in dividends.

PINAL SUMMARY. *Drill*, Sept. 8: We have been through the Silver King mine and will tell what we saw in our next issue. The mine is grand, more of a wonder than ever. The Frankfort, one mile north of Silver King, is down over 40 ft. It is the same general character as Silver King ore. The ore now reached in the Eureka is low grade, but there is plenty of it. They had some small quantity assaying $2,600. The winze in the Australia on the Continental ledge is 50 ft deep. The vein is unbroken from the top 80 ft. In the bottom the mineral is 20 inches wide. Assays, 17 per cent copper, 44 per cent galena, $15.37 silver per ton. They will now sink on the vein, and then drift into the mountain. The Blue Bird, the property of Thomas Farrel, near Martinez canyon, Belle Air, is ascertained to extend 150 ft in width. It adjoins the Martinez. The mineral vein on which work is done, is 16 ft wide. The iron capping all carries galena. The mine lays right across the great wagon road from Belle Air to Butte and is most accessible.

MINERAL CREEK MINES.—In the Ray, Scorpion and Bilk are fifty men employed and the camp is lively. A large quantity of native copper is on the dumps. The Congress and Gap mines show an ore body 820 ft wide and 1,000 ft long, prospected with 30 holes and cuts, each from 5 to 25 ft deep, all in ore, carrying from 5 to 40 per cent copper and $20 in silver. The formation is slate and lime-rock with syenite and quartz. Westerly from the Gap is the Star. This has a working shaft of 65 ft and a crosscut of 16 ft; and a tunnel of 120 ft, with crosscut of 50 ft. There is 4,000 tons of ore on the dumps assaying from 10 to 100 dollars per ton, besides 40 tons of black sulphurets and native silver assaying $300 per ton. Some specimens on the dump go from $15,000 to $20,000.

WALLAPAI MOUNTAINS.—*Alta, Arizona*, Sept. 1 From the Tertio mine at the depth of eighteen feet, a fifty pound sample was found to contain 84 ozs. in silver per ton, vein averaging two feet in width. The Blucher lode at a depth of 12 ft sampled 85 ozs. in silver. The Wallapai Queen from a two-inch pay streak at the surface at the depth of eight feet, developed into a two foot vein interspersed with sheets of antimonial silver assaying 368 ozs. in silver and $18 in gold per ton.

OLD DOMINION.—*Silver Belt*, Sept. 1. Shipments from Old Dominion for the week, 327 bars—103,940 pounds. Total shipments, 4,224,820 pounds. Product for August, with one furnace, 403,810 lbs. Beat this who can. The bullion now produced is 99 fine.

COLORADO.

SAN MIGUEL MINES. Cor. Denver *Tribune*, Sept. 5: Reports of a strike of immense value at Mount Wilson have been circulating at Rico for a couple of weeks. * * * The first property we saw was the European lode on the east side of Monitor mountain. It has an open cut which exposes a vein of 4 ft between walls. A streak five inches wide of solid galena cuts through the vein and may be traced 50 ft up the cliff. Fifty ft below the cut a tunnel has been started showing the same sized vein and streak. * * * Next we visited the Sunlight and Magpie lodes. These are the claims reputed rich, which caused the trip. They are on the northern slope of Monitor mountain. In the Magpie the vein is 300 feet wide, but the formation is very much shaken. The cut of the Sunlight is 100 ft to the east and shows a vein four feet wide, at right angles with the cut. It is composed of streaks of white iron, antimonial silver, decomposed lead and oxide of iron. In the face is a solid body of white iron and antimonial silver. Several mill runs have been had on each of the streaks, the lowest resulting in 104 ounces and the highest in 560 ounces silver. All in all, I have seen no more promising prospect than these claims show at their present stage of development. About a ton of ore has been sacked for shipment. The men were busy building cabins and forges.

RUBY CAMP.—Correspondent of Denver *Tribune*: Our camp shows more activity than at any other period since its discovery. Machinery is in working order in all of our prominent mines. Our concentrators and sampling works are kept running day and night, and the amount of ore shipped will not fall short of $35,000 a week. This is not inconsiderable when it is considered that the amount shipped is produced only in development work.

THE BULLION KING.—The Bullion King has its machinery in place. The shaft is already 120 ft deep, with a south and north drift 150 and 60 ft. The shaft is 4½ by 9 ft inside of timbers, is cribbed the entire depth with hewn timbers and divided into two compartments. The mine has already shipped $60,000 worth of ore, and has on the platform 150 tons of concentrating ore, which runs 40 ounces.

THE RUBY CHIEF.—The Ruby Chief tunnel is driven 197 ft and will be extended 300 ft further. The company has shipped $25,000 of ore and has at least 100 tons of 45 ounce ore on the dump which is being hauled to our local mills. The tunnel follows the course of the vein for 120 ft.

LULU.—Although the mines are in their infancy, developments show them to be rich. About three years ago the mineral was discovered. It has been the prospectors who have developed the camp. The park is somewhat isolated, being 100 miles from Georgetown and 70 miles from Fort Collins, over mountain roads. The park is on the Grand river. Next is Lead mountain, upon which are some of the best mines in Colorado. The Lead Mountain Co. own a group of 10 mines. Among them are the Eureka, Bonanza No. 1 and 2, Snow Flake and Carbonate. All these have a well defined vein of galena and are so located that they are easily worked. The Eureka has a tunnel in 100 ft and has a large and rich body of ore, there being a 6-ft vein of the carbonate, having about 500 ft of tunneling and shafting. Assays from surface rock run up in the hundreds. This is one of the richest companies in the West.

IDAHO.

BULLION CAMP.—Wood River *Times*, Sept. 5: The Jay Gould concentrating works were started up Saturday, and the Idahoan works will soon be. When these get to running there will be four concentrators in operation at Bullion, to wit: Those of the Mayflower, Jay Gould, Bullion, and Idahoan mines. Then the yield of Bullion camp should be 50 tons. This can be kept up all winter, as the mines are in splendid condition, with large reserves of ore in sight and the development work far ahead of present need. The Mayflower mine is making a splendid record. During the past five months it has yielded $50,000 per month, and by the end of this month (September) it will have reimbursed its present owners every cent that it has cost them ($375,000, besides working expenses for a year and a half).

SAWTOOTH AND VIENNA.—Col. Brodhead says that Vienna and Sawtooth district was now producing about 50 tons of ore per day, and would keep up this average until snow put a stop to hauling. The Columbia & Beaver Co.'s mill, Colonel Brodhead said, would probably start up on the 5th. The lixiviating process would be a success.

SMOKY BULLION.—A miner just in from Smoky reports that day before yesterday, some very rich ore was struck in the main tunnel of the Smoky Bullion mine. "It is the prettiest ore I ever saw!" he exclaimed to a *Times* reporter, and added: "It'll go $4,000 or $5,000 per ton."

BULLWHACKER.—An experimental run of Bullwhacker ore was made yesterday at E. Daft's assay office. A sample of 15 pounds was put through the furnace. The result was two bars of base bullion weighing seven pounds, and assaying at the rate of 290 ounces of silver per ton. This, reckoning the lead at 60 per cent, would indicate a total value of about $340 per ton. The ore was not specially selected.

MODOC.—Ketchum *Keystone*, Sept. 5: John Foster & Co., proprietors of this mine, fifteen miles above Ketchum, have sold fifteen tons of ore to the P. M. & S. Co., from which they realized over $3,200, after paying all expenses of mining and transportation. Mr. Foster informed us that one man extracted the ore in fifteen days, and that one ton of the high grade ore paid all expenses.

ELKHORN. *World*, Sept. 4. Hugh Turner has struck a 20 inch vein of very good ore in the old Elkhorn mine, which was worked about eighteen years ago and yielded immensely. After digging out the pay chute, work stopped. Since then a good deal of work has been done in the way of drifting and tunnelling for another pay chute, and Hugh Turner was lucky enough to strike it.

MONTANA.

BOZEMAN.—*Inter Mountain*, Sept. 3: The water-jacket smelter being erected at Cooke city to treat the ores of the Great Republic and other mines owned by the company represented by Major Geo. O. Eaton will have a capacity of 40 tons. The Eastern Montana M. & S. Co.'s smelter has started up on custom rock. It is under lease to the Wills M. & S. Co. There are good leads in the camp, but there is too little development. Where men can find ore near the surface with an assay value of from $70 to $20,000 per ton, it would seem they should proceed to open the mine. This, with the exception of the Eaton mines, has not been done. Possibly they may not have had means to open their properties. Now, however, they can dispose of their ores to a company prepared to work them.

FISH CREEK. The mines in the vicinity of Fish creek are fast coming into prominence. The Maggie is making shipments of ore to Glendale with satisfactory results. This claim is developed by three tunnels, one of which taps the vein at 1,700 ft, and at that point the ore body is of a good width and assays 115 ounces.

NOTES.—Butte *Miner*, Sept. 5: The bullion shipments during the week, amounted to $91,886; credited as follows: Alice, $24,208; Donnel, Clark & Larabie, $14,408; First National bank, $16,330. The Bell smelter closed yesterday for repairs. The concentrators and calcining furnaces are kept running and the blast will be started up again next Wednesday. The 400-ft north crosscut in the Bell mine has advanced 142 ft and is in vein matter. Ore is being hoisted from the old workings through the 270-ft crosscut from the new shaft. The Wild Bill shaft has a depth of 60 ft on the ledge, which continues to look well. W. A. Clark has purchased S. E. Larabie's interest in the Travolna mine in which the first discovery of silver in Summit Valley district was made by William Farlin in 1875. It is believed to be a big mine yet. The center shaft at the Neptune is down 40 ft. Some good ore is being extracted from the old shaft. The west workings and the winze from the 300 S. W. at the Moulton are producing their usual high grade ore. At the Original, the new east shaft is down 75 ft. Some fine ore is being extracted from the stopes of the east and west 300. A large Knowles pump, is being erected on the 400. The developments at Clark's Fraction, which lies between the Alice and Magna Charta, continues to demonstrate the value of the old Rainbow lode. A drift has been run from the east 300 of the Alice, which has reached a point directly beneath the 80 ft workings, and a 3 ft ledge of high grade ore has been uncovered. The assays average 160 ounces and several samples went from 230 to 530 ounces. The drift will be run through the fraction 221 to the Magna Charta line, when crossentting and upraising on the ledge will be commenced. The principal work at the Shonbar just now is sinking the shaft for 300, 400 and 500 levels. An additional pump has been put in at the 230. The stopes of the 230 east drift are looking well and high grade ore is being extracted.

TIDAL WAVE DISTRICT. Ten men are at work on the smelter going up on Wisconsin gulch, and capitalists from Salt Lake and California are looking over the district. The gold mill is having a steady run on ore from the Two Dans and Melrose leads. The first day's run cleaned up over one pound of gold. Everything seems lively and prospectors are striking new leads daily. Ore can be found in this camp that assays as high as $7,000 per ton.

BOWLDER VALLEY.—The ore in the Baltimore is free milling, and there is over 100 tons on the dump. The Chillicothe is turning out silver lead ore, assaying as high as 300 ounces per ton. The shaft is 30 ft deep. The Mono has been retimbered. The Amazon is opened by a shaft 160 ft deep, and is full of promise.

NEW MEXICO.

CLIFTON.—*Southwest Sentinel*, Sept. 5: Mose Stevens, who is in from Clifton, reports rich silver discoveries, 6 or 7 miles north of town. He shows rich samples of ore, and states that the leads are said to be quite extensive. As yet the discoverers only know of the precise location of the find.

OREGON.

MINING NOTES.—Jacksonville *Times*, Sept. 7: Wm. Dorn, who is mining on Elliott creek, just across the State line, says that there are fewer miners there than usual, but all seem to be doing fairly. R. Cook, who has been putting the Roten ledge in Willow Springs precinct in shape for Ross, Dolsen & Co., says there is a well-defined vein of quartz. The Elk Head cinnabar mine in Douglas county is working with good results. It is so arranged that they can take out the ore from the condensers each day, and it averages 50 pounds. Bilger & Magly are manufacturing hydraulic pipe for Logg & McDonnell, who have extensive mines on Forest creek. Jas. Hansen will prospect the Blue Gravel mines at Galice creek this season by drifts, hoping to find the pay streak again.

UTAH.

EMMA. Salt Lake *Tribune*, Sept. 15: The Emma mine at Alta is looking splendid. It will be remembered that work is being done on it through the Bay City tunnel, which has its heading 1,700 ft from the mouth, from which point a shaft has been sunk 200 ft. On the vein drifting has been done both east and west. These drifts are 200 ft vertically below the old workings of the mine, from which so much wealth was taken a few years ago. Ore is being taken out but most of the work is being done for the purpose of developing. The shaft is to be sunk 200 ft deeper, where it is expected to cut the vein at a point 550 ft vertically below the old workings and 800 ft on the dip of the vein. Twenty-eight men are employed.

Iron Stone and Terra Cotta Pipe, etc., for all Purposes.

The manufacture of iron stone pipe for purposes of drainage, irrigation, sewerage water carriage and the like, and the manufacture of terra cotta work for chimneys, for architectural decoration, and for a thousand other uses, is one of the great industries of the country, and is most intimately connected with the health, comfort and convenience of the people. A little idea of the extent of the business may be gained from the fact that for the one purpose of farm drainage there was manufactured in the United States during 1882 about five and one-half million dollars' worth of drain tile. This is one of the most humble uses to which earthen pipe is put, and affords only an inkling to the extent of the production which includes the higher class of goods required for sewerage water carriage and for ornamental purposes. The Pacific coast figures creditably in the production of iron stone and terra cotta materials in proportion to its population. The leading manufactory is that of

Gladding, McBean & Co.,

Which is situated at Lincoln, Placer county, California. The works, of which a sketch is given (3d page), comprise buildings covering an area of 160x230 feet, partly two and partly three story structures. One, just finished, is of brick, 85x230 feet, and is handsomer than one shown in the engraving. The establishment was started in 1875, and has been enlarged continually until the present time, and now has two acres of floor room inclosed. The power is furnished by a 60-horse power engine, driven by two boilers. There is the best machinery for the purposes designed, including a steam sewer-pipe press, clay mills, and tile mills, all run by steam. There are five down draft kilns. The works are made accessible to the cars by 1,500 feet of side-tracks from the main line of the Oregon division of the C. P. R. R., and the site is 11 miles from the junction of the C. P. and Oregon railroads, and 28 miles from Sacramento. The vein of clay is 30 feet thick and of first quality, which justifies the liberal expenditure for manufacturing facilities. There are 75 men employed, and the output of the factory is immense, and goes to all parts of the coast. The main office is at 1310 to 1316 Market street, San Francisco, near the new City Hall, and the firm has agencies all through the Pacific coast towns.

The Products.

Space will not permit us even to enumerate all the varied and useful forms into which clay is made in this large establishment. Indeed, it is not necessary, for the firm issues a handsome illustrated catalogue which gives all necessary information. But we shall allude briefly to some of the manufactures which seem to us of chief interest. First, there is vitrified iron stone sewer pipe, which renders it perfectly impervious to moisture. This pipe makes the perfect conduit for house or street sewerage, which is essential to health and comfort. It is made in all sizes, and with all curves, traps, etc., which may be desired. No one should take the risk of contaminating his well or vitiating the air of his habitation by using a leaky sewer pipe of stone or brick or wood, when a perfectly tight and durable pipe can be obtained at such a reasonable figure as it is now offered at.

For the conduct of water from a distant source nothing can be more wholesome than a clean stone pipe, and in no other way can a large body of water be delivered so cheaply. Well laid, this pipe will stand a pressure or head of sixty feet, and the material should be examined by those who contemplate bringing water long distances for house use or irrigation. It is well understood that irrigators in some parts of the State will have to resort to piping, as the open ditch is so wasteful by evaporation and seepage. Miles and miles of water pipe are being put in this year in San Bernardino county.

Stone pipes make most excellent culverts for roads or railroads. They are easily made, neat and serviceable, and so durable that the use of planks for small road-culverts should be laid aside where the pipe can be had. The engravings on this page show how neatly a culvert can be made with pipe.

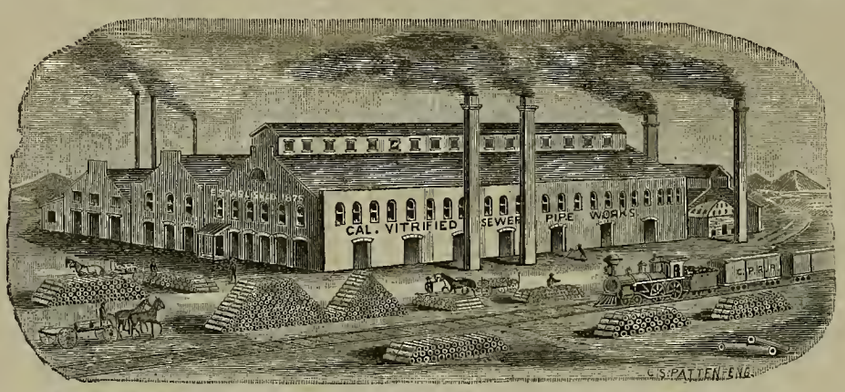
Drainage and sub-irrigation are twin benefits, and for these purposes there is a constantly increasing demand for stone pipe. These pipes or tile are manufactured without sockets or collars, in one-foot lengths, and are laid in the trench with their ends joined as closely as possible. If to be used for drainage, the water will enter where the ends of the tile meet; and if for irrigation, it will escape at the same points. It is shown by statistics that 52,647 miles of tile drains were laid in the United States last year. California has not done as much in under-draining as she should, but there is now a disposition to wise expenditure in this direction, for it has been shown that well drained land is an advantage even in a dry country like ours. Of course some fields are naturally drained by condition of soil, etc., but there are many fields which need tiling.

The fine quality of the fire clay found at Lincoln, not only enables Gladding, McBean & Co. to turn out their fine goods, but the clay in itself is much sought for in the market for fire-brick work of all kinds where heat resisting quality is desirable. The Lincoln fire clay is sent all over the coast for these purposes.

Terra cotta chimney pipe is one of the finest modern discoveries and makes building easy even where brick is not to be had. The terra cotta chimney takes little room. They are cheap, light, easily put up, they do not clog with soot—in fact, so desirable is terra cotta in this respect, that large quantities of terra cotta lining for brick chimneys is sold. Terra cotta chimneys are claimed to be safer than brick if the pipe is well cemented. These chimneys are of different sizes and the terra cotta chimney tops are made in a great variety of handsome forms, so that they are regarded as fit for our finest structures as well as for our cottages. Gladding, McBean & Co.'s catalogue is very full on the subject of terra cotta chimney work, and should be consulted by house builders.

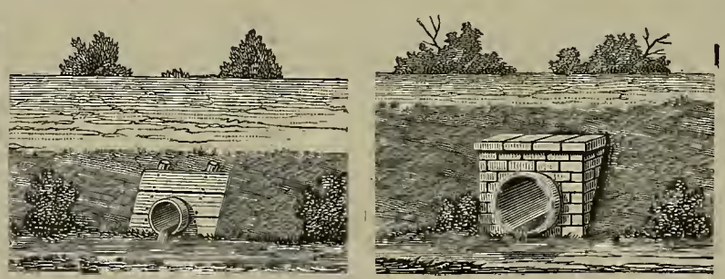
Another interesting branch of manufacture at Lincoln is flower-pots, plain and ornamental, garden vases, hanging baskets, wall pots and fern cases, and everything of that kind to delight the amateur or professional florist and gardener.

We have not space to examine these interests farther at this time, but those who feel inclined have the privilege of doing as we did—call and examine the samples of manufacture at the large yard near the New City Hall in this city, or send for the illustrated publications of the firm, just issued.



ESTABLISHMENT OF GLADDING, McBEAN & CO., LINCOLN, PLACER CO., CAL.

HARRISON J. MCKUSICK, Superintendent of the Railway Mail Service of the Pacific coast, has gone to Reno and Mound House station, the northern terminus of the Carson and Colorado railroad, to set mail service cars in operation on that road. This arrangement is one of the successes achieved by Mr. McKusick at the recent conference of mail service managers in Washington, D. C. Three cars will at first be put on, with the usual corps of clerks. They will run from Mound House to Hawley's, a station not far from Independence, Inyo county, a distance of about 200 miles, and will supply quick mail facilities for a large district heretofore comparatively isolated in that regard, being supplied only by stages over long routes. The mails for Inyo county and some districts south, that went formerly by stage from Mojave, will now be sent by the overland train to Reno, thence to Virginia City and Mound House.



METHOD OF MAKING SEWER PIPE CULVERTS.

A NEW YORK lumber dealer recently imported from the Pyrenees a walnut log which is twelve feet long and nine feet in diameter, and weighs 22,000 pounds. It is estimated to be worth $2,000 as it lies, and when it is sawed into veneering it will yield 66,000 feet, which will be worth $5,000.

THREE miners named Timby, Minnes and Littlejohn were coming out of the 500-foot shaft of the Gagnon mine, at Butte, last Friday. When 300 feet from the bottom the cage broke, and the miners fell backward and were crushed into an almost unrecognizable mass.

TENNESSEE is making progress in the development of its coal and iron mines.

IT is estimated that about 800,000 freight cars are in use in this country.

Cassiterite, Spodumene and Beryl in the Black Hills.

Cassiterite is found in place and in stream deposits in the central regions of the Black Hills, Dakota, about two miles from Harney, in Pennington county. This tin ore occurs in a vein, or mass, of coarsely crystalline granite rising through the fine-grained micaceous and siliceous slates of the Huronian period flanking the granite axis of the Harney range of mountains.

At the principal point of discovery, known as the Etta claim, the feldspar quartz and mica are in unusually large crystals. Some of the cleavage blocks of feldspar measure from twelve to twenty inches across, and the mica crystals have yielded sheets of commercial value. In addition to these minerals, there is an abundance of spodumene in gigantic crystals, ranging from two to six feet in length, and from eight to twenty inches in diameter. The first masses of tin ore found were imbedded in the midst of the crystals of spodumene and of feldspar, and yielded fragments of nearly pure cassiterite weighing from one to fifty pounds and more. The chief associate or gangue of the tin ore is, however, a dense aggregation of small crystals of mica, of a light yellow color, forming irregular veins and bunches in the midst of the granitic mass. In this micaceous rock, formed of the mica with a white spar, apparently albite, the tin ore is disseminated in grains from the size of a mustard seed to the size of peas, and sometimes an inch in diameter. These grains are irregular in form; no perfect crystals have yet been found. They can be easily separated from the mica by crushing and washing. The ore appears to be very clean; no wolfram has yet been found with it in the mica, but a few crystals of a black mineral, believed to be wolframite, have been seen in the mixture of spodumene and feldspar. No topaz has yet been identified.

At another locality, where large plates of muscovite mica have been mined, I have found beryls in large crystals, imbedded in a matrix of quartz, resembling the beryls found in the mica mines of Acworth, New Hampshire, though not so large.—*Wm. P. Blake, in American Journal of Science.*

PAPER ROOFING.—A Mansfield, Ohio, company are manufacturing a roofing material from wood-pulp board consisting of two-thirds spruce and one-third poplar. It is then prepared, under patents owned exclusively by the company, in such a manner as to give the greatest durability, and adapt it generally for roofing purposes. It is claimed to be the best roofing in the world, all things considered. It is not affected by heat or cold, as metallic roofs are, nor can it corrode. It is much lighter than slate, weighing only about 50 pounds to the square, and can be walked upon without injury. It is practically fireproof, though not absolutely non-combustible. It can be used on any kind of a roof having not less than 1½ inch fall to the foot. It is especially adapted to locations where smoke and sulphurous gases abound, which generally destroy metallic roofs in a short time. It is flexible, and can be used for valleys, flashings, ornamental cut-work in gables, panels, bay windows, verandas, and irregular-shaped roofs. It can also be used with perfect success for sheathing warehouses and grain-elevators.

Population of Montana.

Montana must have assimilative powers superior to any thing recorded in the history of the nations, if she succeeds in making a homogeneous population out of the unnumbered varieties of races, peoples, and tribes which are pouring into our Territory. No commonwealth has ever before undertaken to harmonize and make congruous so heterogeneous a population.

Of Indians, we have Crows, Piegans, Gros Ventres, Flat Heads, Bannacks, and remnants of several other tribes. Of Mongolians, there are Chinese, Japanese, and Laps. The Shemites are represented by Jews and Arabs. Africa sends us Cops, Congoes, Moors, and Caffers. The Aryans are represented by Pilgrims, Norwegians, Russians, Poles, Swedes, Danes, Austrians, Hungarians, Prussians, Dutch, Swiss, Italians, French, Canadian French, and Halfbreeds, Spaniards, Spanish Americans, and Peons, English Canadian English, and Halfbreed English, Scotch and Irish, Mennonites and Mormons.

But the most discouraging feature of this gathering of races and people, is the fact that there is a majority of no one nationality. If we had a majority of Anglo-Americans, of Englishmen, of Frenchmen, or of Germans, we might hope that such a majority would so assimilate all the others as to make a harmonious if not a homogeneous people. But with every nationality largely in the minority, and with so many conflicting civilizations, clashing religions, and national and social customs, it will be almost impossible to avoid most irritating frictions and deadly feuds. The first immigrations into Montana were less heterogeneous, and the Anglo-Americans and Irish-Americans, and German-Americans, largely assimilated in the States, had a vast majority of the whole population, and after a rapid but somewhat destructive fermentation of the conflicting elements, the result was a population similar to the populations of the Northwestern States whilom so called. But there were several circumstances which greatly hastened this happy result.

The early settlers of Montana found themselves in the midst of savage and hostile tribes, and more than a thousand miles from any civilized people to whom they could look for efficient succor, and the necessity for self-defense in this isolated condition, drew them together as with bands of steel.

Probably there never was a frontier people in which there was so large a proportion of first-class, well educated and well disposed men as were found in the early mining camps of Montana, and these men in their organizations for defense against external savage foes, and still more savage road agents and gambling roughs, learned to appreciate each other's good qualities, and to work together in establishing the regular machinery of civil government and social progress. These facts rendered the assimilation of conflicting elements a short and easy work, and the result was one of the best populations of the continent.

Then came the Utah & Northern and poured into our southwestern towns and camps the restless, lawless crowds which ever follow the progress of all railroads penetrating unsettled regions. And now comes the Northern Pacific rushing in from the east an eager multitude of all the conflicting elements of Canada and Europe, and from the west the mongrel hordes of Asia and the Pacific Islands, stirring society to its very dregs.

What will be the result of this new fermentation no one can tell; but every anthropologist and every patriot will watch the struggling civilizations, and mark well the results. Montana is now working out the most complicated social problem of the ages. It is our belief, however, that the various civilizing and enlightening agencies at work in our midst will produce a homogeneous people worthy of the grand country we possess.—*Helena Independent.*

THE CHENEY COAL MINE.—It would seem as if nature was extravagantly prodigal in her mineral bounties to Southern California. She has been more than lavish in her distribution of the precious metals, and recent developments indicate that she has been equally liberal to the southern section of the State with the equally valuable useful metals. To keep time with the great silver discoveries in Calico, an equally promising gold discovery was made six miles from Pinacate, thirty miles from Colton, and four and a half miles west from the C. S. Railroad, to which from the mine a splendid road has been furnished by one of nature's road-masters, who often do their work to endure. The vein struck is six and a half feet in width, and the prospects are excellent that it extends at least one and a fourth miles in length. The country is a "level flat," the access all that could be desired, the facilities for development excellent. A tunnel has been run along the vein of 170 feet in length, and the "ledge" not only retains its full width, but is slowly enlarging, while the coal gets harder, finer and in every feature better. In going down, clay strata are struck, which, according to coal mining experts, point strongly to the existence of very wide coal seams below,

THE ENGINEER.

Modern Steamers.

The *Nautical Magazine* remarks that there is one thing that we know, or should have learned from the vast experience of the last ten or twenty years—an experience, perhaps, as gloomy and unsatisfactory as it has been rash—that the majority of "cargo steamers" as at present constructed and sent to sea, have already—long since—reached the limit of safety in loading; if, indeed, many of them have not got much beyond it. If this be not so, how are we to account for the great number of such vessels which annually disappear? There is surely unmistakable evidence to prove that something is wrong somewhere, for many of them are comparatively new ships. After two long centuries of experience of all kinds of ships, and over all seas, a vanished school of able and sagacious seamen laid it down that a good ship, fairly loaded and ably commanded, will live in any storm, excepting, perhaps, cyclones and hurricanes, and the accidents which they engender; she positively cannot sink, but is as certain to ride over those great rolling mountains of seething water as a well built church is of standing on its foundation.

It is a great mistake to suppose, as some ship builders really do, that because a ship is big, no heavy seas will ever run on board. In consequence of this fallacy they take all manner of liberties in designs and constructions. It is difficult to believe there are such opinions in such quarters, yet it is so, notwithstanding. There is, doubtless, less science imported into ship building now than in former times, when iron for such work was a novelty, and when the worthy blacksmith, though occupying an indisputable position, played only second fiddle in the symphony; but the merest riveter should understand that the long, low steamers which are now turned out of our building-yards are the wettest, and, in too many cases, the most dangerous ships which ever put to sea. A great ocean wave, however high or fast it may run, will lift up bodily any small ship or boat, but not so some 400-footer; and, as a matter of course, if it cannot lift, must run over some part of her. Allowing such a wave to run at thirty five miles an hour, and a great part of its crest, say twenty-five tons of water, to overwhelm her decks, we have at once a force equal to the charge of a locomotive against everything in the shape of an obstruction to its course. Yet it is common to see such ships putting to sea with all kinds of trumpery and feeble fittings, such as obtained in high-sided ships of fifty years back—feeble, it should be said, in relation to the amount of freeboard or bad weather to be encountered, and afterward doleful accounts in the newspapers about "terrific weather and fearful damage."

A PROBLEM IN FLYING.—An interesting discussion is at present going on among scientific engineers in regard to the flight of birds, which has considerable bearing on the flying-machine question. It is a matter of observation that birds, without any movement of their outstretched wings, and without any apparent muscular exertion, are enabled to rise in the air and to move laterally even against the wind. The *modus operandi* of these movements is a mystery, and scientists are trying to discover the secret. The most plausible theory is, that the wings may be placed in such a position as to divert a current of air from its normal course until it represents two sides of an angle, of which the apex is the hinder portion of the bird's body. If that be the case, say the theorists, there would be really two currents of air coming into collision at the apex, the result of which would be a pressure upon the body of the bird at that point, urging it forward with force far greater than might be supposed. The smoothness of the feathers in but one direction reduces to a minimum all opposition to a forward movement. Experiments are now being carried out with mechanical contrivances to demonstrate the correctness of the theory, and it is stated that the investigators are in a fair way to a discovery of the cause of the phenomenon.—*London Cor. Philadelphia Telegraph.*

REGISTERING TRAIN SPEED OVER BRIDGES.—Mr. D. B. Kagenaar, of the University of Utrecht, recently devised a novel arrangement for registering the speed of trains while passing over bridges. It consists of two parts. At each end of the bridge is fixed a pedal, placed against the rail so as to be depressed by each wheel of the train passing over the spot. Each depression of the pedal makes contact in an electro-magnetic circuit, which, in part 2, acts on needles placed against a cylinder situated at any convenient distance. This cylinder is made to revolve by clockwork, at a uniform speed, and is covered with a sheet of paper. While no wheels pass the pedals on the bridge the needles mark straight parallel lines on the revolving paper sheet; but if contact is made as above mentioned, the respective needles are momentarily deflected, and mark the instant at which each wheel passes the pedal in connection on the bridge. The distance apart of the pedals at each end of the bridge being known, as also the rate at which the registering cylinder revolves, the speed of the passing train can be reduced by simple measurement of the distance apart of the traces made by the marking needles.—*Iron Age.*

USEFUL INFORMATION.

Waterproof Clothing.

For some time past the Belgian War Department has conducted a series of experiments at Valverde on the waterproofing of soldiers' uniforms by means of liquid alumina. With respect to the hygienic side of the question, the medical authorities have satisfied themselves that the articles of dress thus treated permit the perspiration to pass off freely, and chemical analysis has proved that the preparation used in no way injures the materials or destroys their color. More than 10,000 yards of materials, redressed two or three times over, notwithstanding the rinsing and washing to which they have been subjected after having been soiled, and after constant wear, remained perfectly waterproof.

The only drawback to the process appears to be that it is not very economical, and to insure the desired result, must be conducted on a large scale, which requires a considerable amount of plant.

The following, according to the *Journal d'Hygiene*, is the process employed: Acetate of alumina is obtained by making solutions of equal parts of alum and acetate of lead in separate vessels, and then mixing them together. Sulphate of lead will be thrown down, leaving acetate of alumina in solution, which must be decanted. The materials to be waterproofed are soaked in this solution, and then withdrawn without being wrung, and dried in the open air.

MUSCLE VS. MACHINERY.—A singular contest took place in a New Hazelton, O., coal bank the other day, says the Cleveland *Trade Review*. It was the old question of muscle vs. machinery, in a new form. A Harrison mining machine had been placed in the mine, and as usual, a great deal of good-natured discussion was held as to its working. On the one hand, it was claimed that it could do the work of four men; on the other, that two men could outdo it. Finally came a challenge to a friendly combat from two sturdy sons of toil, John Applegate and Joseph Hogan, the two men to put their work alongside that of the machine for three hours, the winning party to capture a purse of $100. Great interest was manifested in the match, hundreds of people gathering to await the results. For three hours—with the exception of eight and a half minutes lost by the machine man in changing from one room to another and in replacing picks—the underground contest raged. At the end of that time, the judges found by measurement that the machine had dug 154 square feet, and the two men 147 square feet, giving the victory to the machine, but by close margin, which was certainly most creditable to the men. The pick men gave forty strokes to the minute, the machine 150. An average day's work for the pick is a twelve foot room, three feet deep, or thirty-six square feet; of the machine, three eighteen-foot rooms, four and a half feet deep, or 243 square feet, but it is evident from the contest that the machine can make in one day of nine hours 462 square feet. We are glad to see that miners are growing to appreciate the advantages of machines, and welcoming them as friends rather than viewing them as enemies.

CEMENT FOR LEATHER.—When pieces of leather are to be cemented together, which are not subjected to traction or need not sustain heavy weights, *New Remedies* says that common glue will probably be the best binding substance; for thin leather, ordinary flour paste may also be used.

If the leather is subjected to a moderate strain, the following method may be used: Soak equal parts of glue and of isinglass for ten hours with enough water to cover them, then add about one-fourth part of tannin, and boil until the mixture becomes sticky. The surfaces of the leather must first be roughened with some coarse tool; they are then well rubbed with the above mixture, while warm, and firmly pressed together. After a few hours they will be found united.

Or glue (8 parts) may be soaked with water until soft, the excess poured off, and the vessel then placed on a water bath until the glue melts. One part of the glacial acetic acid is then added, and the mixture transferred to small vials. This liquid glue will also stick leather together very firmly.

An Austrian firm manufactures a glue which is said to be made from the entrails (skins?) of cattle which goes by the name of dermatin, and is reported to be used in England as well as on the Continent. This is said to glue leather together so effectually that the mended place will be as good as new, while it leaves it perfectly flexible.

SINGULAR OCCURRENCE.—A large cylinder of a Woolf engine, employed in the mines of Sarrebruck for about a year, was recently opened and examined. Attached to the piston was a large mass, brown and waxlike, weighing more than 150 kilogrammes (about 330 pounds). It contained 50 per cent of oxide of iron, 26.77 per cent of organic matter soluble in alcohol, 5.7 per cent of insoluble organic matter, and a residue composed of water with a little silicic acid. During the time the cylinder had been in use, about 192 kilogrammes of suet had been used for lubrication. The decomposition of the suet into glycerine and fatty acids led to the formation of a soap of protoxide of iron. The oxidation of the iron, which is limited chiefly to the interior of the cylinder, gradually produces an enlargement of the diameter. The cure for this is a mineral oil of good quality and a high boiling point.

A TOOL, after it has been forged, should be so hardened or tempered that it will never want to come to the fire again until it is so worn down that it requires reforging. This accomplishes two things—first, it saves the time lost in a second hardening; and, in the second place, it avoids the damage always done to the cutting power by rehardening without forging.

A FINE FINISH can be given to iron or steel, when turning, without polishing, by using a sharp cutting tool and keeping the work moistened with water. A bright and glistening surface is produced by this simple lubricant that is very pleasing to the eye.

A BUTTER TEST.—Sulphuric acid is said to be a simple, certain test for adulterated butter. Fresh, pure, yellow butter by the slightest contact with sulphuric acid turns almost a pure white, while oleomargarine made from tallow changes to a deep-crimson red. When lard or other oils are used the colors are diversified, showing all the colors of the rainbow.

HARDENING STEEL.—If a piece of steel be hardened and lifted from the water before it is cold, a crack or flaw may be the result. The reason is that the outer surface being very hard and the inside hot expansion commences, and a breakage of the hard, chilled surface is the consequence.

STAINING CHERRY IN IMITATION OF OLD MAHOGANY.—Digest logwood chips in vinegar or acetic acid for twenty-four hours or more. When ready to use, heat the solution, then dip the wood until the suitable color is obtained.

GOOD HEALTH.

Rheumatism.

The joints, the hinges of the body, are affected by rheumatism in such a way that the slightest motion gives pain. A creaking hinge is dry, and turns hard. A single drop of oil to moisten it makes a wonderful change, and it instantly moves on itself with the utmost facility. Rheumatism is an inflammation of the surface of the joints. Inflammation is heat; this heat dries the surface; hence the very slightest effort at motion gives piercing pain. In a healthy condition of the parts nature is constantly throwing out a lubricating oil, which keeps the joints in a perfectly smooth and easy working condition. Rheumatism is almost always caused by a cold dampness. A dry cold or a warm dampness does not induce rheumatism. A garment wetted by perspiration or rain, or water in any other form, about a joint, and allowed to dry while the person is in a state of rest, is the most common way of causing rheumatism. A partial wetting of a garment is more apt to induce an attack than if the entire clothing were wetted; because, in the latter case, it would be certainly and speedily exchanged for dry garments. The very moment a garment is wetted, in whole or in part, change it, or keep in motion sufficient to maintain a very slight perspiration, until the clothing is perfectly dried.

The failure to wear woolen flannel next the skin is the most frequent cause of rhumatism, for a common muslin or linen, or silk shirt, of a person in perspiration becomes damp and cold the instant a puff of air strikes it, even in midsummer. This is not the case when woolen flannel is worn next the skin.

This troublesome affection is cured by keeping the joint affected wound around with several folds of woolen flannel; second, live entirely on the lightest kind of food, such as coarse bread, ripe fruits, berries, boiled turnips, stewed apples, and the like. If such things were eaten to the extent of keeping the system freely open, and exercise were taken, so that a slight moisture should be on the surface of the skin all the time, or if in bed, the same thing were accomplished by hot teas and plentiful bed clothing, a grateful relief and an ultimate cure will very certainly result in a reasonably short time. Without these, the disease will continue to torture for weeks, months and years.

Inflammatory rheumatism may, for all practical purposes, be regarded as an aggravated form of the common kind, extended to all the joints of the body, instead of implicating only one or two. For all kinds, time, flannel, warmth, with a light and cooling diet, are the great remedies.—*Sanitarium.*

The Power of Suppressing Pain.

There are cases which I doubt not are very familiar to you, in which we can withdraw ourselves, as it were, from even severe physical pain by determinedly fixing our attention upon something else—either external objects or internal trains of thought. A very admirable example of that kind was prevented not long since by a well-known physician of this city, Dr. Edward H. Clarke, with whose case I have become acquainted through my friend, Dr. Oliver Wendell Holmes, who wrote a charming little notice of him affixed to the work on "Visions," which has been published since his death. The fatal malady from which he suffered during the latter months of his life produced the most agonizing pain; and yet he could determinately withdraw his consciousness, so to speak, from that pain, by fixing it upon another object, that object being the working out of his own mental train of thought in the composition of this book. This is well known to have been the case also with regard to Sir Walter Scott, who, during a very severe and painful illness, dictated the "Bride of Lammermoor." And the most remarkable fact about its composition was, that after his recovery, he entirely forgot all that he had done, the book, on its publication, coming to him as an entirely new work with which he had had nothing whatever to do. He only remembered the general outline of the story upon which he had composed his novel; this he had heard in early life, and it remained with him; but of the working up of this story into the novel, while he lay on his sofa contending with paroxysms of agony, he had no recollection. Thus, in the case of Walter Scott, as in that of Dr. E. H. Clarke, we see the effect of determined fixation of the attention upon a train of ideas in mastering physical pain. And I shall give you another most remarkable example of the same thing in the case of Robert Hall, one of the most celebrated preachers of my early years, of whom, I suppose, most of you have heard. He used to go into the pulpit suffering the most agonizing pain, which was found after his death to have resulted from a large calculus in his kidney, with projecting points, the terrible suffering produced by which every medical man will at once appreciate; and was obliged habitually to take some of the largest doses of opium that were ever administered in order to keep this under at all. But from the moment he began his extempore sermon (the introductory service having been performed by his colleague), he seemed utterly unconscious of it. During the latter portion of his life, which was passed in Bristol, I was often his hearer, and, like every one else, was most deeply interested in his discourses, while at times quite carried away by the torrent of his eloquence. I was assured by eye-witnesses that when he went down into the vestry he would sometimes roll on the floor in agony, though during his pulpit address he had ceased altogether to feel pain.—*Dr. Carpenter in Medical Journal.*

Hydrophobia.

For some time M. Pasteur, the French investigator, has been experimenting with a view of discovering whether the fatal infection of rabies can be disarmed of its power by inoculation. It is said that he now possesses four dogs which are proof against the infection, whatever may be the method of inoculation used or the virulence of the matter, while other dogs inoculated with the same virus invariably perish. The experimenter raises the question whether these four animals owe their impunity to spontaneous recovery from a mild attack, which may have escaped observation, or whether they are naturally refractory to the disease. One of the three dogs which he inoculated in 1881 survived, and though twice inoculated in 1882 he did not become rabid. The importance of finding a remedy for all forms of hydrophobia is magnified by two facts brought to light by the researches of M. Bert. One of these is that even if the saliva of a mad dog does not communicate rabies, it may prove fatal by producing serious local injuries; in other words, the secretions of rabid animals have poisonous properties over and above the special rabic virus. The second fact is that it does not follow because a dog which has bitten any person does not die, that the animal is free from rabies. These conclusions will add to the terrors of the disease; but there is some consolation in learning from M. Bert that the mere salivas of rabid dogs do not always communicate the deadly virus, and apparently never communicate it unless they contain the mucus from the respiratory organs, which seems to be the fatal portion of the saliva.

POISONOUS EFFECTS OF PETROLEUM SMOKE.—A curious instance of poisoning from the smoke of petroleum is reported in the *Neue Freie Presse*, of Vienna. A workingman's wife brought to a local hospital a child eighteen months old who had been seized early in the morning with violent convulsions, and had subsequently become unconscious. She also stated that her husband, on awakening, had been taken with cramps, and had an uneasy sensation in his upper and lower extremities, accompanied by headache, from which she was also suffering. The singular color of the child, and the result of careful examination, led to the conclusion that there had been acute poisoning from smoke gases. It was then discovered, that in the small and ill-ventilated bed-room occupied by the parties in question, a petroleum lamp was used as a night lamp, the flame being reduced as much as possible. The wick had, however, been left projecting without the protection of a glass cylinder. In this way the flame, of course, emitted smoke. The father (himself a delicate man) was also found to exhibit symptoms of poisoning. By the exertions of the medical men in charge of the cases, both the father and the child have progressed so far toward recovery that their restoration to health is confidently expected.—*Lancet.*

MINING AND SCIENTIFIC PRESS.

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See Advertising Columns.

Passing Events.

There has been very little of special interest from the mining regions worthy of note of late, aside from what we have given in our usual "summary." Mining matters are rather quiet in this State, and at this season of the year when water is low many mines are shut down which later on will he at work.

We speak elsewhere of the progress of mining in Mexico. Doubtless many California miners are interested in that region, or will be, and will he glad to hear that it is being opened up by Americans.

The yellow fever at Guaymas is the topic of the hour, and measures are beiug taken to prevent the disease being hrought to this port.

AT different times during the past two years the question of building a railroad from Napa through Berryessa valley to Lakeport has heen agitated, and within the past two weeks graders bave been at work on the survey and the projectors of the scheme in a few days will put on a large force of men to carry the work on rapidly.

THE increase of 20 per cent by the State Board of Equalization of the assessment in Alameda county makes the total assessment $57,200,000.

ON the 17th inst. Hon. J. P. Jones was elected a Director and President of the Excelsior Powder Co.

THE Nevada shooting team beat the California team three points in the Inter-State match.

Home Manufactures.

There is very little question now that California will, before many years, become a great manufacturing State. Our manufacturing industries are gradually iucreasing in number aud extent, and the past four or five years particularly have sbown great advance in this direction. Many of our natural products, heretofore neglected, are being looked after, and more of our raw materials are being worked up among us, instead of being sent abroad. It is unnecessary to enumerate a catalogue of these things. Even the most unobserving of our citizens must have noticed how many more manufacturing enterprises there are than formerly. It is a good symptom of our material advancement and progress, and a sure indication that our community is becoming more and more self-supporting.

There is another thing which is beiug slowly overcome, but not to such a degree as it should be; that is, a curious disposition to helittle our own products, and to prefer the imported ones. We see the signs "Our own manufacture" more frequently than we used to; still, it is uot as sure an attraction as it should be. In articles of luxury we cannot compete with older communities, and for many things we must yet depend on the importers. Bnt, for many staples and manufactured things, we shonld prefer the things made by our fellow-workers in the community. People, in purchasing, should show a decided preference for home-made things; should always patronize our home industries when it is possible, and speak favorably of them when they deserve it.

The proper way to encourage home manufactures is to buy aud use home-made goods. It does no good to admire their appearance aud buy some imported thing of the same kind, simply because it has been customary to buy that brand or make. When one buys, he gives the best indorsement that can be given; all the testimonials and recommendations in the world will not speak as highly for an article as a purchaser's money. If we want the people to prosper who manufacture among us, we must buy what they make. In this way, and no other, can California he made a great manufacturing State.

New Battery Screen.

An improved form of battery screen for quartz mills has just heen patented through the MINING AND SCIENTIFIC PRESS Patent Agency hy Mr. Andrew S. Hallidie, the well-known wire manufacturer of this city. Ordinary screens are made of a single sheet of pnnched metal, or piece of wire cloth of the desired size of mesh. These screens are secured on a frame which is held in place in the grooves in the battery front by means of wedges. Whether of punched metal or wire cloth, the screens are always of flat pieces.

Mr. Hallidie branches out with the new idea of constructing the screen with angles or corrugations, so as to give more screen surface to the given size of battery opening. In the construction of the improved screen he employs woven wire, punched metal, or any other snitable screen material, and bends or corrugates the material into angular faces or flutings. Supporting rods or hars are fixed in the screen frame, so as to pass down in the angles of the corrugations and give any desired degree of stiffness.

In order to retain these screens in position they are fixed in frames which are shaped to fit the openings in the mortar in which the screens are to be placed. The top and bottom rails of these frames bave corrugated slots or grooves formed in them, corresponding with the shape of the corrugations of the screens, so as to hold them firmly in place. The screen made in this way instead of presenting a vertical flat surface to the splash of the water, presents a series of V-shaped faces, the screen surface being thus relatively increased, and the screen stiffened and strengthened. Mr. Hallidie is confident that this constructiou will make the screens last much longer, as they are not so apt to "bulge" and become broken as those of ordinary construction.

THE abolition of the tax on matches is, under the opinion of revenue officers, causing the former illicit manufacturers to go out of business, there being so many brands that are better and can he sold cheaper than the inferior quality made by them.

Mexican Mines.

In couversation with J. D. Schuyler, of Culiacan, Sinaloa, Mexico, who is in this city on a business errand, we learn that Americans are buying up many mines in various parts of Mexico, and that many old mines are being opened and developed in a systematic manner. In the district of Cosala, 80 miles east of Culiacan, there are many good mines, and some persons think the district will prove itself the richest in the world. A party of Colorado men who recently spent some months in the district examining the mines, say tbey saw more good mines there thau in the whole State of Colorado. There are some old mines there that have been worked for ages. Many of the old ones have been abandoned for one reason or another. In Cosala district is a famous one called the San Jose de las Bocas. It bas yielded an enormous amount of money, but the heirs of the original owners were in litigation for many years, and on one occasion the one in possession robbed the pillars and left the mine in very bad shape. It has, however, heen in bonanza continuously for 50 years.

Americans have bonded the Nuestra Senora mine that has a vein 110 feet wide. Its present owner is a Spaniard who has worked it for 20 years with 10 or 12 men in a "puttering" sort of way, yet realizes about $100,000 a year. There is another mine in the same district owned by the Anglo-Mexican Mining Co. This is a Belfast (Ireland) Co., but it has an office in this city. They are about to seud down a 20-stamp mill. It is said they have a vein 80 feet wide and running from $60 to $500 per ton.

About 10 miles west of Cosala is a rich miue owned by Americans. Some 20 miles southeast is the famous Guadalupe de Los Reyes, which is yielding steadily from $80,000 to $100,000 a month. It is owned by a Mexican, but is kept in fine condition. The machinery is first-class, and the hacienda, town and mine are lighted by electricity. Everything about the mine is in good shape. Right over the mountain is the Jocnitista, helonging to Haggin & Tevis, of this city, which is yielding from $50,000 to $75,000 per month.

In the district east of Culiacan, just over the line of Durango, are some very rich mines. In most of these districts transportation has been so high and business so uncertain that a mine had to be very rich to pay at all. They have been throwing aside ore that would not go $10 or $12 to the cargo of 300 pounds. There are no smelting works for general use. The very large mines have their own reduction works, but the smaller ones are without them. There are thousands of small mines that would pay if there were centrally located works where ores could be sold when mined.

An American company from Tennessee recently bought a gronp of seven mines, about 100 miles northeast of Culiacan. They have ordered a 10 stamp mill in this city, which will be forwarded next month. Some more Americans have located what they think is the best mine in Mexico. It is in a country which until a year or so has been inaccessible on account of Indians and bad characters. It is one and a half days' journey north of Topia. The mine is called the Tahualneto. The legend connected with it is to this effect: It has turned out millions of dollars, and there was at one time struck in it a vein of solid silver one foot wide. The mine is known to have heen worked for over 200 years. There are near by ruins of a very large town, hacienda, etc. The workings in the mine are from 1,000 to 1,500 feet deep. The Indians repeatedly killed off the men who came from time to time to work the mine. Others would come, re-establish the hacienda, and begin work, only to be driven off. There is a tunnel 7 feet square running in over 500 feet, to the vein itself. No work was done on the vein, however, the miners having evidently been driven off just as they finished the tunnel. This tunnel is in very hard rock, and evidently lime was used instead of powder. The blast-holes are very close together indeed, and appearances all point to the use of lime. Some San Francisco men having found the mine abandoned have taken it up, and are going to drift along the vein from the tunnel.

OVER 200 British, American and German missionaries in China have addressed a petition to the British Government praying for the bolition of the opium trade.

Testing Quality of Pozzolana.

One of the most difficult and slowest operations in industrial chemistry is that of determining the quality of pozzolana (from which hydraulic cement is made), so as to give, in conjunction with lime, a mortar of great resistance. A method of analysis is proposed by Mr. Landrin which, in preference to those already known of Vicat and Caundenherg, has the advantage of only requiring a short time for the experiment. In fact, Vicat's method, which consists in observing the action of the water of lime on the pozzolana, requires, in order to obtain satisfactory results, a period of several months.

It seems that the most careful analysis of the pozzolana cannot determine its quality, but simply its components. But if the pozzolana is treated with hot chloro-hydric acid, there will be obtained a soluble and an insoluble substance, and it will be seen that the latter is nearly entirely composed of silicious matter. Mr. Landrin states that it is frequently the more or less quantity of silica capable of being united with lime that determines the quality of the pozzolana. But for such determination it is not the quantity of silica shown by the analysis that must be computed, but only that which can combine with the lime.

Mr. Landrin experimented on three qualities of pozzolana: one coming from Reunion Island, one from Italy, and the last manufactured near Paris. Relying on the fact that the hydraulic silica has the property of reducing the water of lime, he treated the pozzolana with boiling chloro-hydric acid and put a certain quantity of the insoluble substance thus obtained in the water of lime. In 24 hours he was thus able to ascertain that the action of this silica was such that it reduced, in the true pozzolana, an enormous quantity of water of lime. The silica of the Italian pozzolana reduced in that short interval, about 105 times its volume of water of lime. On the contrary, the French artificial pozzolana, which, by analysis, had given a larger quantity of silica than the two others, only reduced, in the same interval, four times its volume of water of lime. In effect this latter pozzolana produces but an inferior quality of cement.

The experiments made in comparison with the preceding method, that is, treating hot the insoluble substance of the pozzolana, but the pozzolana itself with water of lime, have shown that these methods can in no wise be compared with the rapidity of the one just described.

Mr. John S. Hittell, the well known California writer, who is now in Europe, sent recently some fine samples of pozzolana from Rome to the State Mining Bureau. The material is found near Rome as a dark brown sand, and is used in all the mortar of Rome and vicinity. It is exported to make hydraulic cement, and Mr. Hittell is preparing an essay on its value as compared with Portland cement.

What is supposed to be a deposit of this valnable substance was found a short time since near Berkeley, and some of it was sent to Mr. Hanks, State Mineralogist. He proposes to make some tests by the method above described. Some of the cement sent him was quite hard, but we understand that practical men in the business have tried the local pozzolana, and found it did not come up to expectations, making a substance that was friable and soft. The tests Mr. Hanks will make will he of interest in this connection.

NEWSPAPER ACCOUNTANT.—Albert Hart, formerly private secretary for Gov. Bootb, Gov. Pacheco and Gov. Perkins, has been appointed newspaper accountant of the San Francisco postoffice. The office is one of trust and responsibility, and there is considerable work attached to it. Accounts have to be kept with each newspaper and sender of periodicals, whose mails are paid for by the pound. An extensive set of books has to be kept, and great accuracy observed. From what we know of Mr. Hart, we expect that he will make an invaluable officer in this department.

THERE are at present 700 men, forty steam boilers, three steam barges, a steam launch and a tug, employed in constructing the steel railway hridge across the Firth of Forth. The work is being prosecuted with great energy. A wooden pier, eighty feet broad, and carrying a double line of rails, bas been carried 1,200 feet from the south shore, and will he continued 700 feet further to the point where the first caisson-tower will be placed.

UPWARDS of 500 men are engaged in extending the "dummy" road of the Market street railroad to the ocean beach.

Water Wheel Experiments.

(CONTINUED FROM PAGE 177.)

velocity being small, the resistance of the air may be neglected. We have then:

$$G_3 l_1 = \varphi (G_3 + \mathfrak{G}) \frac{C_2}{C_3} l_1 + \varphi \mathfrak{G} \frac{C_2}{C_3} l_2$$

$$\varphi = \left(\frac{C_3}{C_2}\right) \frac{G_3 l_1}{G_3 l_1 + \mathfrak{G}(l_1 + l_2)}$$

In our case t was about 25 seconds and l_1 4.32 feet, hence G and G_3 were practically identical.

A number of experiments were made leading to a mean result φ .045.

Having thus found the useful work (L), the expression for the efficiency of the wheel (η) was reduced to a convenient form, as follows:

Let a represent the area (in square feet) of the supply pipe at point A (see Fig. 4), beyond which all losses are charged to the wheel.

Let v represent the velocity (in feet per second) of the water in the pipe at that point.

Let Q represent the quantity of water (in cubic feet per second) discharged through the nozzle.

Let γ represent the weight of one cubic foot of water = 62.3 lbs.

Let h represent the hydraulic head (in feet) at point A as given by the gauge.

Let H represent the actual head (in feet) to be charged to the wheel.

Then $H = h + \frac{v^2}{2g} = h + \left(\frac{Q}{a}\right)^2 \left(\frac{1}{2g}\right)$

A number of experiments were made establishing the weight of water ($Q_1 \gamma$) discharged per second through the nozzle under head H_1. Then for any head H (not differing much from H_1) we have

$$Q\gamma = Q_1 \gamma \sqrt{\frac{H}{H_1}} = M_1 \sqrt{H},$$

Wherein M is a constant for any one nozzle, and H is calculated, as above indicated, from observed values of h. In our experiments we had practically $H = h +$ a constant, for any one nozzle, the heads varying but slightly.

The energy of supply water charged to the wheel is then $Q\gamma H = MH^{\frac{3}{2}}$. Hence the efficiency:

$$\eta = \frac{L}{MH^{\frac{3}{2}}}$$

The following curves of efficiency have been plotted from experiments made by the class: Ten experiments with a ¼-inch nozzle under head H = 55.4 feet, and eleven experiments with a ⅜-inch nozzle under head H = 50.1 feet. These were made with different velocities of the wheel, in order to determine not only the highest efficiency, but also the importance of a slight deviation from the best speed (see Fig. 8). The vertical lines mark the number of revolutions of the wheel per second, and the horizontal lines the efficiency.

The greatest efficiency reached with the ¼-inch nozzle was 66.4% at 9 revolutions per second, and with the ⅜ inch nozzle 75.1% at 8 revolutions. The great difference in these results is doubtless attributable in the main to the spread of the water after entering the bucket. The wheel being encased in a glass cover, this was easily discerned in the water discharging from the wheel (see Fig. 9). In the second case the energy of the discharging water is more under control, since it remains more nearly in the plane of motion of the wheel. There is some difference, of course, in the loss due to journal friction in the two cases, but this loss amounts only to about 2 in the first and 1 in the second case.

The efficiency reached would probably be further increased:

1st. By flaring the entrance to the buckets, as shown in Fig. 10, so that a still larger nozzle could be used, and the spread of the water in the buckets be still further diminished.

2nd. By regulating the angle β (see Fig. 2) so as to better adapt it to the actual best velocity as found by experiment. This was provided for in the manner of attaching the vanes; but there was no time left for the experiments.

3d. By making the angle of the bend, immediately back of the nozzle, more obtuse. In our case this angle is 90° and the loss 7-10ths per cent. By doing this the nozzle might also be shortened and the angle a made smaller.

4th. It is also surmised that there would result a gain from shortening the buckets at the discharge end and making the curve there sharper.

The great advantage in gearing for transmission of power causes such preference for the vertical wheel that outer discharge was adopted, notwithstanding the difficulties encountered in setting the nozzle.

Partial Jonval Turbine. Fig. 11.

This wheel has some advantages over the tangential wheel in the setting of the nozzle. The angle a may be made much smaller, and consequently it is not necessary to use so many buckets. It is our intention to experiment with such a wheel with the next class in hydraulics.

FIG 11.

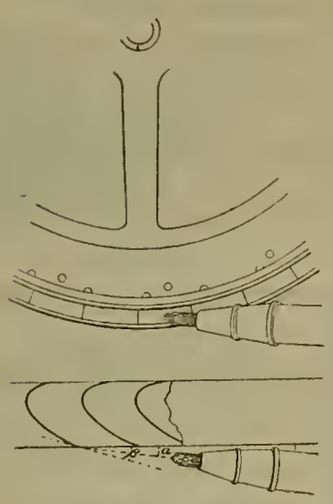


Fig. 8.

¼ inch nozzle H = 50.1 feet. ⅜ inch nozzle H = 55.4 feet.

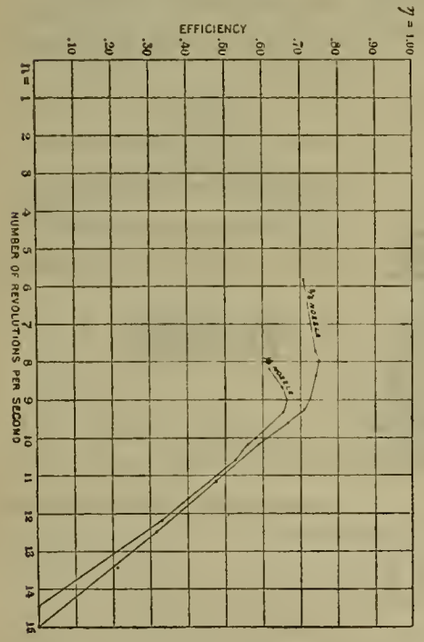
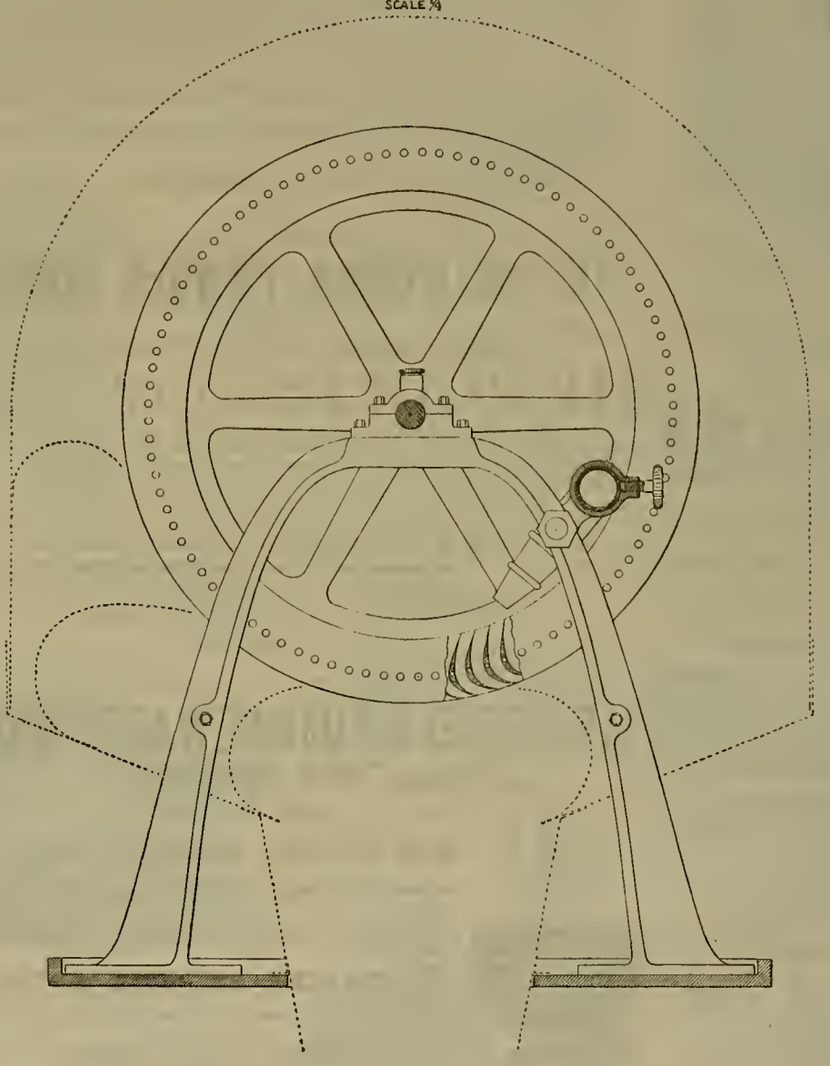


FIG. 3.

PARTIAL TURBINE (TANG. WHEEL)
SCALE ¼



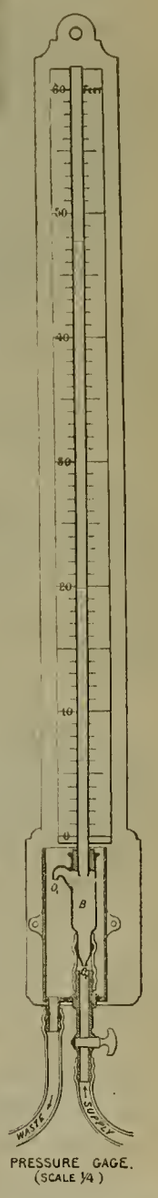
Ventilating Levels.

There are a number of methods of inducing air currents for ventilating drifts or tunnels. Ventilation may be either natural or artificial. In sinking shafts, unless the shaft be deep, a simple brattice of thin wood or painted canvas dividing it from top to bottom into two, will usually be sufficient. The men working in the shaft on one side of the parting will raise the temperature somewhat, when it will be converted into an upcast, while the cool air will descend on the other side.

A natural current may often be produced in a long level by means of an "air sollar." To form an air sollar, the floor of the level carrying the tram road is laid about six inches above the actual bottom of the level, and is supported by cross sleepers resting on blocks of wood or stone, or the flow in the center of the level may be excavated somewhat deeper than the sides. Planks are laid over the sleepers just mentioned to form a kind of deck, and the whole is rendered airtight by plastering with mud. This divides the level or tunnel into two very unequal portions. Through the lower division, or air sollar, a current of cool and heavy air will pass to the force at work.

The air heated by the breathing of the men, the heat of lamps, etc., will pass out through the level itself, and so a constant current is kept up. The level should be kept as truly level or dead as possible for several reasons, two of which may be mentioned: First, if there be water flowing through the level, and the fall be considerable, the rapidity of the current of water will, to some extent, check the ingoing air. Second, if the level rise rapidly the floor of the end will soon be at a higher actual level than the "roof" of the entrance, when the heated air will actually have to descend in order to make its escape, although the natural tendency of heated air is always to ascend.

FIG 5.



PRESSURE GAGE.
(SCALE ¼)

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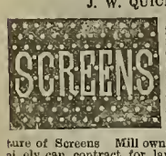
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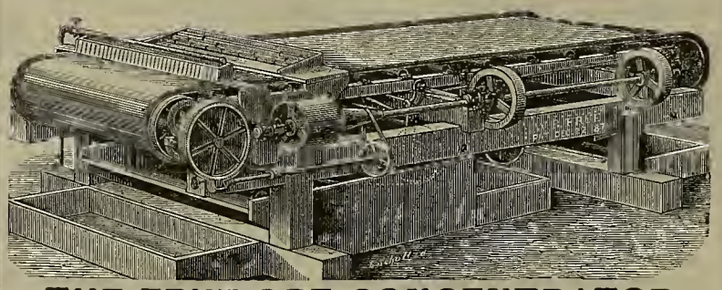


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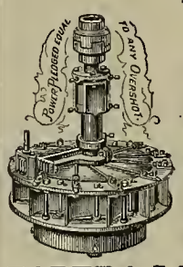
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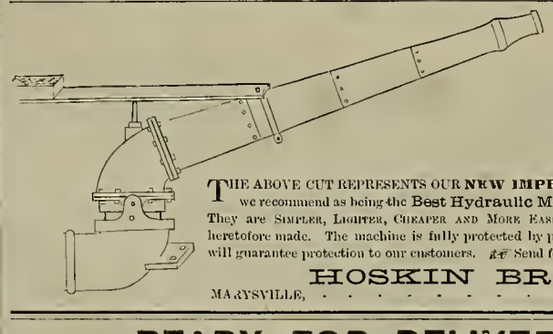
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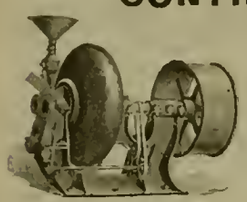
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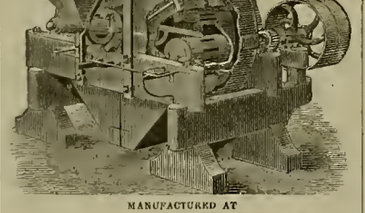
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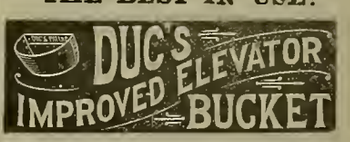
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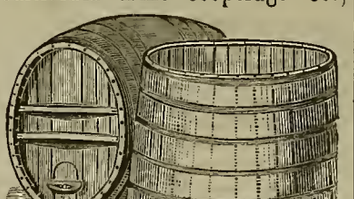
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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & CO.'S SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING SEPTEMBER 11, 1883.

284,795.—COOKING STOVE AND RANGE—N. S. Arnold, S. F.

284,797.—CAR COUPLING—A. D. & C. M. Atwood, Portland, Or.

284,708.—PUMP—H. M. D. L. Babcox, S. F.

284,709.—HARROW, ROLLER AND SEEDER—James R. Bane, Gilroy, Cal.

284,620.—STEAM SAWING MACHING—E. N. Dunckel, Butte City, M. T.

284,735.—BATTERY SCREEN—A. S. Hallidie, S. F.

284,742.—SEPARATION OF NITRIC AND SULPHURIC ACIDS—F. Jenssen, S. F.

284,747.—FLOOR CLAMP—H. D. Margot, Mountain View, Cal.

284,748.—VEHICLE SPRING—N. L. McAdam, S. F.

284,750.—THILL COUPLING—J. McLaughlin, San Rafael, Cal.

284,759.—ANIMAL TRAP—Wm. H. Reed S. F.

284,763.—FIRE ESCAPE—M. Scholl, S. F.

284,920.—FRUIT LADDER—Ira Stevens, San Jose, Cal.

284,693.—CUPEL MOLD—H. W. Walker, S. F.

284,783.—DRESSMAKERS' RULE.—Wm. Wallace, Oakland, Cal.

284,789.—CAR COUPLING.—F. Woodward, Sac., Cal.

3,506.—LABEL—L. B. Greenslade, Los Angeles, Cal.

284,800.—CAR AXLE—Geo. W. Bedbury, Portland, Oregon.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

SEPARATION OF NITRIC ACID FROM A MIXTURE OF NITRIC AND SULPHURIC ACID.—Fred Jenssen, S. F. No. 284,742. Dated Sept. 11, 1883. This process of separating from a mixture of nitric and sulphuric acids the nitric acid in separate portions, or quantities according to their several strengths, and by a continuous operation, consists in passing a continuous stream of the mixture through a connected series of retorts, to which are given separate degrees of heat, and in distilling the nitric acid over from each retort into separate receptacles. In this operation the strongest nitric acid, requiring the least degree of heat, will distil over from the first of the retorts, and the weakest from the last, where the greatest heat is required, so that in each of the receptacles there will be a different strength of acid. The reason of the mixture in the first place may be either to concentrate the nitric acid, by subsequent distillation, or it may be acquired in the progress of many operations unnecessary to mention here. The apparatus which Mr. Jenssen uses to accomplish the separation consists simply in a number of vessels or retorts, so arranged and connected each with an entrance and exit that a liquid may be supplied to the first, whence it shall pass through each and find an escape from the last. With each of the retorts is connected its receiver, or condenser, and with the last is connected a suitable cooler.

ANIMAL TRAP.—Wm. H. Reed, S. F. No. 284,759. Dated Sept. 11, 1883. This is an improvement on that class of animal traps known as the "gravitating platform trap." The invention consists in the peculiar weighted platform. The platform is arranged to oscillate, and suitable weights return it to its position. The animal in trying to reach the bait steps on the edge of the platform, which gives way and drops him into water or the box. The platform, relieved of the animal's weight, resumes its normal position again immediately.

THILL COUPLING.—John McLaughlin, San Rafael, Cal. No. 284,750. Dated September 11, 1883. This improvement for connecting the shafts or poles, to vehicles, consists of plates projecting from slips upon the front axle, and having slots adapted to receive the cross bars of links which are rigidly fixed to the shafts.

VEHICLE SPRING.—Neil L. McAdam, S. F. No. 284,748. Dated Sept. 11, 1883. This consists of a combination of springs and a series of suspending rods producing an oscillating as well as an elastic movement of the body. It also consists of such combination and arrangement of the springs that they serve as braces to the rear axle, and their front ends are so mounted that no bolster is necessary.

FLOOR CLAMP.—Henry D. Margot, Mountain View, Santa Clara Co. No. 284,747. Dated Sept. 11, 1883. This is a machine for adjusting the matched stuff of floors and ceilings so that each board may be fitted and secured to its place with accuracy. The object of the invention is to force the boards to their place and hold them until secured, with the exercise of little power and without damage to the boards. It may be used for floors or ceilings.

HARROW, ROLLER AND SEEDER.—James R. Bane, Gilroy. No. 284,709. Dated Sept. 11, 1883. This is a combined harrow, roller and seeder of peculiar construction, an effective and easy working agricultural implement being provided. An intelligible description would be difficult without the aid of engravings.

An Improved Steam Jet Pump.

A very effective steam jet pump of an improved construction is now being introduced on this coast. It is entirely different from the ordinary steam jet pump as ordinarily made, and is designed to do more work with less steam. In this pump the water or liquid enters through a series of cones. These cones are so arranged as to cause the liquid to come in contact with the jet of steam in several streams. The angles of these streams are such as to give them an upward and forward motion. A portion of the liquid passes through the first coue, and is forced upward through the pump by the jet of steam. The liquid which enters through the next cone has its flow accelerated, both by the force exerted by the steam and by the impetus of the liquid which has passed through the first cone. This double action is carried on until the liquid passes through the pump and reaches the discharge pipe, where (having obtained great rapidity of motion) it is carried on with sufficient power and velocity to accomplish the object.

In short, the force exerted by a jet of steam is the active agent; the vacuum formed is all utilized as auxiliary, and the impetus gained by the liquid first submitted to the action of the steam jet, is applied as motive power to the succeeding streams of liquid; a triple action which increases the power and capacity of the pump, and at the same time reduces the amount of steam consumed.

The water or liquid is compelled to leave the pump and enter the discharge pipe in a solid body without spraying; a good head being thus obtained. When using steam of an excessive pressure the steam does not "cut through the water as the conductor of the force pump prevents any steam entering the discharge pipe."

A great peculiarity of this steam pump is that it has no valves, no moving parts, no pistons, cranks, belts, pulleys, cogs or fly-wheels, and takes no oil, no packing, and no care. Having no mechanical movement, it requires no skill to set it up or operate it. This is a very important item to those at a distance from machine shops or mechanical help. It requires no attendance, and can be operated and controlled from a distance, by merely opening or closing a single globe-valve. As it has no tortuous courses for the ingress, egress and flow of water or liquid, no small vents, passages or glands, no valves to keep tight, it will elevate and convey liquids containing sand, mud, or other foreign matter, or which are gritty or greasy, so long as the liquid remains in a fluid state.

The pump is made of brass, and is extremely portable and compact. It occupies no room to speak of. In fact, one to lift 300 gallons an hour only weighs about half a pound, and one which lifts 3,000 gallons will weigh, perhaps, three pounds. It is fixed in place on the pipe, and looks like an ordinary brass coupling. Mr. Edward A. Rix, the agent, has one at work in his store at 18 and 20 Fremont street, and it is a matter of surprise to most persons to see so small an appliance do so much work. The pumps cost all the way from $6 to $7 up to $20, according to size.

This Van Duzeu improved patent is both a force and lift pump. It will pump water from ponds, wells, rivers, vats, tanks, cellars, for agricultural and mining purposes, for mills or factories, etc., and is adapted to all the uses of a steam pump. Any one can fit it to the pipe himself. This useful appliance will no doubt be very largely used when better known. Its low first cost is a very great advantage, and lack of mechanism is another.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $4 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turning a leaf.

The State Fair.

State Fair week this year fell in an area of delightful weather, for only on one or two days was the heat excessive. The attendance was large, and the patronage of the fair satisfactory, for the receipts were $19,475.80 this year, an excess of $2,383.15 over last year's income. We have not space to give the whole list of premiums, but append the awards in certain classes:

Implements and Machinery.

CLASS 1.—H. P. Gregory & Co., S. F., portable steam engine, honorable mention; Faulkner & Hill, Woodland, punch and shears, special premium recommended; M. R. Rose, Sacramento, best display of machinery from one shop; Joseph Enright, San Jose, best portable steam engine; Henning Bros., Sacramento, gas machine, diploma; Henning Bros., Sacramento, self-generating gas burner, diploma.

CLASS 2.—Agricultural Machines (First Division)—F. A. La Shells, Briggs Station, cylinder and concave teeth for thrasher, special premium recommended; Baker & Hamilton, Sacramento, best horse hay rake, best lawn mower; H. P. Gregory & Co., S. F., circular sawmill operated by steam and water, awarded a diploma; Baker & Hamilton, Sacramento, best thrashing machine; A. & A. Heilbron, Sacramento, best cider mill and press and best hand corn sheller; Laufkotter & Dalton, Sacramento, best sweep horse-power; Holman, Stanton & Co., Sacramento, best hay press, best post hole auger, best well auger, and best lawn sprinkler.

CLASS III.—Agricultural Implements (Second Division)—W. A. Howard, Dixon, best harrow; D. M. Osborne & Co., S. F., best combined reaper and mower and best self-binding harvester; J. D. Winters, Davisville, best derrick for stacking grain, and best header wagon nets for stacking grain; Baker & Hamilton, Sacramento, best broadcast seed sower, best reaping machine, best corn planter; best potato planter, best display of reaping and mowing knives, best hoe; Grangers' Business Association of Sacramento Valley, spring-toothed single and double broadcast seeder, special premium recommended; Judson Manufacturing Co., S. F., best mowing machine; A. & A. Heilbron, Sacramento, best one-horse cultivator; William Gutenberger, Sacramento, best field roller and crusher; J. F. Hill, Sacramento, harrow with self-cleaning attachment, special premium recommended.

CLASS IV.—Agricultural Implements (Third Division) D. B. Matlock, Sacramento, best farm gate; John Klees, Sacramento, best grain separator and fanning mill; T. M. Lash, farm gate, honorable mention; Holman, Stanton & Co., best farm feed mill and best platform scales; A. & A. Heilbron, best windmill.

CLASS V.—Tools and Household Implements—J. D. Winters, Davisville, best churn; Baker & Hamilton, Sacramento, best garden seed drill and best ironing machine; A. & A. Heilbron, best road scraper; best display of haying and harvesting tools; M. R. Rose, best well pump; Holman, Stanton & Co., best sausage meat cutter and stuffer; William Gutenberger, best apparatus for raising water for irrigating and mining purposes; A. L. Coombs, Grass Valley, Plumber's improved fruit drier, special premium recommended.

CLASS VI.—Plows Holman, Stanton & Co., Sacramento, gang plow; Holman, Stanton & Co., sulky plow; Baker & Hamilton, Sacramento, stubble plow; A. & A. Heilbron, Sacramento, sod plow; A. & A. Heilbron, Sacramento, steel plow; A. & A. Heilbron, cast iron plow; Baker & Hamilton, Sacramento, sub-soil plow; Baker & Hamilton, sidehill plow; A. & A. Heilbron, one-horse plow; Baker & Hamilton, Sacramento, dynamometer; Baker & Hamilton, chilled plow; Baker & Hamilton, plow for all purposes; Dr. C. Grafton, Stockton, double gang plow, special premium recommended.

Vehicles—Best family carriage, J. F. Hill, Sacramento, best top buggy, J. F. Hill, Sacramento; best open buggy; A. Meister, Sacramento; best two-seated open wagon, A. Meister, Sacramento; best trotting wagon, Grangers' Co-operative Association, of Sacramento Valley; best spring market wagon, San Jose Agricultural Works; best breaking cart, J. F. Hill, Sacramento; best ladies' phaeton, A. Meister, Sacramento; best business wagon, J. F. Hill, Sacramento; best carriage or cab for children, G. W. Hancock & Co., Sacramento; best display of carriage wheels, hubs, etc., J. F. Hill, Sacramento; best wagon brake, Grangers' Business Association, of Sacramento. A large number of entries in this department, for which there were no premiums offered, were given an honorable mention or recommended for a special premium.

Incubators—Best incubator, Dias & Co., Petaluma (Petaluma incubator); best mother or brooder, Dias & Co., Petaluma.

Mechanical Products.

Leather, Paper and Rubber Goods—E. Bernheim & Co., Oakland, display boots and shoes, pair Congress gaiters and pair gent's dress shoes; Asher Longshore, Sacramento, exhibition traveling trunks, valises, etc.; Weinstock & Lubin, Sacramento, pair dress boots, heavy boots, ladies' slippers, ladies' gaiters and bootees; F. Foster & Co., Sacramento, display bound account books; L. A. Reisler, patent side saddles; Main & Winchester, San Francisco, best set double harness and best set single harness; C. H. Krebs & Co., Sacramento, decorative paper hanging and display of paper hangings and borders; J. T. Stoll, Sacramento, Mexican saddle, display of saddles and bridles, display of saddle trees, gent's saddle, side saddle, patent collar; W. F. Peterson, Sacramento, hair bridle.

Worked Metals—Huntington, Hopkins & Co., Sacramento, copper work, brass work, modern building ware, general hardware, iron and steel, mechanics' tools, horse-shoes (machine made), table cutlery, pocket cutlery, circular saws, files, pruning shears, pruning knives, anti-friction metal, and shot; Scott & Muir, Sacramento, display of plumbers' goods and wares, gas chandeliers and burners, lamps; G. W. Hancock & Co., Sacramento, display of silverware; J. T. Stoll, Sacramento, display of saddlers' hardware; Shafer & Bronner, tinware, copperware,

Stoves, Castings, etc.—L. L. Lewis & Co., Sacramento, cooking stove (for wood), cooking stove (for coal), parlor stove, warming furnace, cooking range, portable range, hollow ironware and ornamental fruit and flower stand; Aitken & Fish, Sacramento, parlor grates; Shafer & Bronner, Sacramento, laundry stove; Henning Bros., Sacramento, gas stove.

Musical Instruments—Frank J. Johnson, Sacramento, banjo and case (California make); F. R. Girard, San Francisco, best organ (Western Cottage organ), best reed instruments; Girard piano was recommended as a home production; A. Bruenn, Oakland, best general display of musical instruments, best piano (Sohmer Grand); W. G. Badger, the committee recommended the Hallet & Davis piano as one of superior production.

Furniture (California manufacture)—Mrs. W. H. Mead, Sacramento, center tables; B. F. Farrar, San Francisco, display of mattresses, best spring mattresses, special premium recommended for section mattresses; John Breuner, Sacramento, dressing bureau, sofa, lounge, extension table, office chair, set of parlor chairs, sidetables, set of parlor furniture, display of furniture, writing desk, bookcase, wardrobe, sick chair or couch, school furniture, set of bed-room furniture, display of upholstery, office desk; Alexander Jansen, San Francisco, sofa beds, special diploma recommended.

Woodenware (California manufacture)—Billingsley & Co., Sacramento, cedarware, pineware, oakware willowware, splitwood baskets, osier ware, assortment of coopers' ware.

Dental and Drawing Instruments, etc.—Robert Beed, Oakland, artificial limbs; C. J. Noack, Sacramento, magic clock.

Chemicals—Billingsley & Co., Sacramento, display of blacking; Bidwell & Co., Sacramento, yeast powder; M. A. Reeves, San Francisco, Reeves' Great Electric Hair Tonic; Standard Soap Co., S. F., display of soaps; Thomas' cold water bleaching soap; lubricating petroleum; display of saleratus, potash and alkalies; display of candles.

Stoneware, Bricks, Confectionery, etc.—H. F. Bundock & Bro., Sacramento, stoneware; Billingsley & Co., Sacramento, demijohns; W. F. Peterson, Sacramento, confectionery; G. W. Hancock & Co., queensware, ground and cut glass, glassware, ground glass and stained glass.

California Drawings, Designs, Marble and Granite Work—Aitken & Fish, Sacramento, collection of polished marble work, six pieces; marble mantel and carved marble mantel.

Force.

EDITORS PRESS:—In the London *Engineer* of August 19th is an editorial article on the definitions of "force," as given by several distinguished scientists. The definitions are worthy to be quoted and are as follows:

"Force is an action exercised on a body tending to change its state of either rest or of uniform motion in one direction."—[Isaac Newton.

"Force is that which tends to cause or destroy motion, or which actually causes or destroys it."—Henry Mosely.

"Force is said to be whatever produces, destroys or changes motion."—[Whewell.

"Force is an action between two bodies, either causing or tending to cause change in their relative rest or motion."—[William Macquorn Rankine.

"Force is any cause which changes or tends to change a body's state of rest or motion." [Harvey Goodwin.

"All we know is that bodies under certain circumstances alter their velocities at a given rate, and this state of change of velocity, or taking into account the mass of the bodies, their change of momentum."—[Prof. Tait.

"The presistance of force is the one great unquestionable, all-embracing principle which explains all other principles, including evolution itself, and is the foundation of the physical universe."—[Herbert Spencer.

To these definitions may be added the following:

"Force is elemental mind."—[Aristotle.

"Monad," particles of matter, are continually active, and are continually changing their situation in virtue of this principle of innate, indefinable perception.—[Leibnitz.

"Matter in motion is the expression of force." [Tyndall.

It will be noticed that with the exception of Aristotle and Leibnitz, the conceptions of the scientists quoted relate to the effect of force, rather than to force itself.

In this connection, I beg to present some views of my own on the subject which, for the sake of brevity, I will give in the form of answers to possible questions, premising that physical science is the knowledge of the laws of the cosmos or material universe and the application of their principles to human purposes.

The cosmos or material universe is composed of matter, force and motion. Matter is the embodiment of force. Force is the soul of matter. Motion is the effect of the action of force in or on matter. Matter may be called the embodiment of force, because force pervades matter as does the human soul the human body. Force may be called the soul of matter because of its analogy to the human soul. This analogy consists in this: First, like the human soul it has three powers or laws; second, it is visible only in its effects; third, the effect of its action on or in matter is life, motion and development. The powers of the human soul are will, memory and understanding. The powers and laws of force are, respectively, radiation, gravitation and equilibrium.

The difference between the human soul and force consists in this: In the human soul the will is free; in force, radiation, its analogy, is subject.

The effect of the action of force in or on matter is life, motion, and the phenomena of development, or nature. Nature is matter, force motion, and the laws and effects of their development. The practical advantage of knowledge of nature's laws is, that while nature, to a certain extent, is subject to man and obeys his will, still it obeys according to its own laws. Therefore, unless these laws are understood, provision cannot be made for their harmonious action, without which the best possible effect in art are unattained. JOHN B. WARD.

San Francisco, Sept. 15th.

THE fashion of industrial exhibitions is spreading. Even Reikjavick, the capital of Ireland, has one. Among the exhibits are gold and silver work, wood carving, pictures, machines, fishing-tackle, clothing, carpets, saddlery, linoleum, etc., the products of home industries.

AT the Congress of Commerce and Industry, at Amsterdam, now in session, a resolution has been adopted declaring that the principal cause of the depreciation of silver results from a decrease in its coinage in Europe. A wish for a common double standard throughout Europe and America was also expressed.

THE Massachusetts Commission of Immigration says the worst class of paupers they are called upon to provide for come through Canada, and additional legislation is asked to prevent such influx.

A MAN pushing a hand car from St. Louis to this city, has got as far as Salt Lake.

THE best medicine of the age for quickly curing indigestion, nervousness, etc., is Brown's Iron Bitters.

Departed Mine Operators.

Two noted mining men, widely known all over this coast, have passed over to the "silent majority" Col. C. W. Lightner, and General John W. Gashwiler. The former came here in 1849 and was at one time superintendent of the Union Iron Works, when owned by James Donahue. At one period he was also superintendent of the Sacramento Gas Works. He was President of the Ophir Mining Co. when that lode was immensely rich and seemed inexhaustible in extent. At the time Raymond & Ely paid such heavy dividends, and was selling for enormous sums of money, he was president of the company. He was afterwards superintendent for a number of years of the Sulphur Bank quicksilver mine, in Lake County. These are only a few of the mining enterprises with which he was connected in the course of his long experience on this coast.

Gen. Gashwiler was a typical California pioneer, and popular everywhere as "Old Gash." He was an early miner in Tuolumne county, and was one of the first at the front of the Washoe excitement in Nevada, where he was an organizer of the water company supplying water to the people on the Comstock. He was more closely, however, identified with California quartz mines, and his name was prominently connected with the Plumas-Eureka, Sierra Buttes, Hayward Keystone, Original Amador, Seaton, Black Bear, Klamath and dozens of other California mines. He attended to large interests for English mine owners, and was one of the best mine promoters on this coast. His operations in Belmont a few years ago attracted great attention. He was for a time at the Black Hills, in Dakota; and has mined, or been connected with mines in one way or another in all the Pacific States and Territories. Gen. Gashwiler had hosts of friends, as he was plain, unassuming, generous and hopeful. He was one of the most noted of the mine operators of this coast.

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, Sept. 20 1883.

ANTIMONY—Per pound			14 @ 15
IRON—American Pig, soft, ton			30 00 @
Scotch Pig, ton			26 00 @27 00
American White Pig, ton			@
Oregon Pig, ton			@
Clipper Cap, Nos 1 to 4			32 50 @35 00
Refined Bar			4 @
Horseshoes, keg			5 50 @
Nail Rod			7½@
Norway, according to thickness			6@ 7
STEEL—English Cast, lb			16 @ 25
Black Diamond, ordinary sizes			14 @
Drill			15 @ 16
Machinery			12 @ 14
COPPER—Ingot			22 @
Sheet			31 @ 35
Sheathing, Inmed, 14x18			22 @ 23
Nails			17 @
Bolt			31 @ —
Old			8 @
Bar			@ —
Cement, 100 fine			15½@
LEAD—Pig			4@ 4½
Bar			6 @
Pipe			7 @
Sheet			8 @
Shot, discount 10 on 500 bags: Drop, ₱ bag			2 10 @
Buck, ₱ bag			2 30 @
Chilled, do			2 50 @
TIN PLATES—Charcoal			7 55 @
Coke			5 50 @ 5 75
Banca Tin			25 00 @
Australian			25 00 @
I. C. Charcoal Roofing, 14x20			6 50 @ 6 80
ZINC—By the cask			19 @
Sheet, 7x3 ft, 7 to 10 lb, less the cask			90 @
NAILS—Assorted sizes			3 30 @ 4 75
QUICKSILVER—By the flask			34½@ 35
Flasks, new			1 65 @ —
Flasks, old			85 @

PHYSICIANS prescribe Brown's Iron Bitters for indigestion, weakness, low spirits, etc.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

INFORMATION is wanted at this office of one Joseph Craig, formerly of Cass county, Illinois, who came to California in 1849.

REMITTANCES to this office should be made by postal order or registered letter, when practicable. Cost of postal order, for $15 or less, 10 cts.; for registered letter, in addition to regular postage (at 3 cts. per half ounce), 10 cts.

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Rev. G. W. RICE, editor of the *American Christian Review*, says of Brown's Iron Bitters:

Cin., O., Nov. 16, 1881.

Gents:—The foolish wasting of vital force in business, pleasure, and vicious indulgence of our people, makes your preparation a necessity; and if applied, will save hundreds who resort to saloons for temporary recuperation.

BROWN'S IRON BITTERS has been thoroughly tested for dyspepsia, indigestion, biliousness, weakness, debility, overwork, rheumatism, neuralgia, consumption, liver complaints, kidney troubles, &c., and it never fails to render speedy and permanent relief.

Seaton Gold Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Drytown, Amador county, California. NOTICE.—There are delinquent upon the following described stock, on account of Assessment No. 3, levied July 31, 1883, the several amounts set opposite the name of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Martin, A, Trustee	6	5,000	$400 00
Martin, A, Trustee	7	5,000	400 00
Martin, A, Trustee	8	5,000	400 00
Martin, A, Trustee	9	5,000	400 00
Martin, A, Trustee	10	1,000	80 00
Martin, A, Trustee	11	1,000	80 00
Martin, A, Trustee	12	1,000	80 00
Martin, A, Trustee	13	1,000	80 00
Martin, A, Trustee	14	1,000	80 00
Martin, A, Trustee	15	1,000	80 00
Martin, A, Trustee	16	1,000	80 00
Martin, A, Trustee	17	1,000	80 00
Martin, A, Trustee	18	1,000	80 00
Martin, A, Trustee	19	1,000	80 00
Martin, A, Trustee	20	500	40 00
Martin, A, Trustee	21	500	40 00
Martin, A, Trustee	22	500	40 00
Martin, A, Trustee	23	500	40 00
Martin, A, Trustee	24	500	40 00
Martin, A, Trustee	25	500	40 00
Martin, A, Trustee	26	500	40 00
Martin, A, Trustee	27	500	40 00
Martin, A, Trustee	28	500	40 00
Martin, A, Trustee	29	500	40 00
Martin, A, Trustee	30	4,000	320 00
Martin, A, Trustee	31	900	72 00
Martin, A, Trustee	33	5,000	400 00
Martin, A, Trustee	34	5,000	400 00
Martin, A, Trustee	35	5,000	400 00
Martin, A, Trustee	36	4,000	292 00
Martin, A, Trustee	38	5,000	400 00
Martin, A, Trustee	39	5,000	400 00
Martin, A, Trustee	40	5,000	400 00
Martin, A, Trustee	41	5,000	400 00
Martin, A, Trustee	42	5,000	400 00
Martin, A, Trustee	43	10,000	800 00

And in accordance with law and an order of the Board of Directors, made on the 31st day of July, 1883, so many shares of each parcel of said stock as may be necessary will be sold at public auction, at 528 California St., Room 6, San Francisco, Cal., on THURSDAY, the 27th day of September, 1883, at the hour of 1 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

A. MARTIN, Secretary.

OFFICE—Room 6, 528 California St., San Francisco, California.

September 5, 1883.

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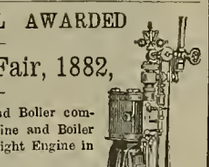
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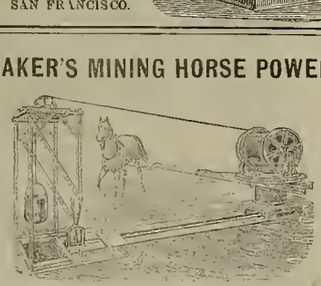
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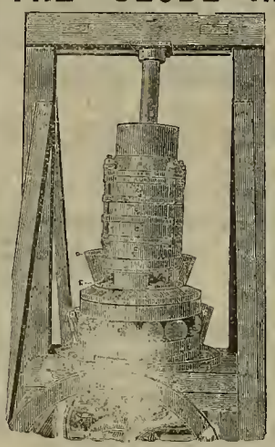
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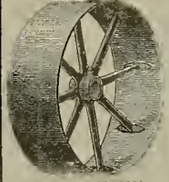
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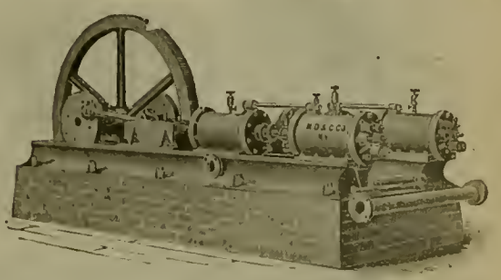
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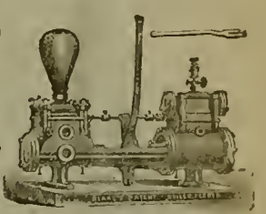


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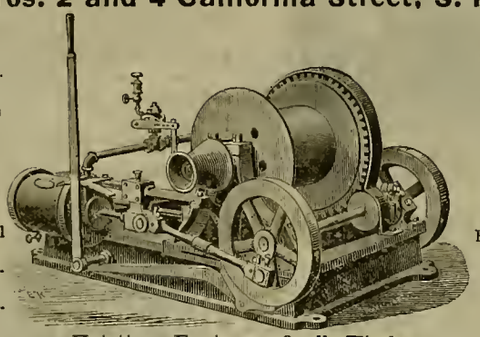


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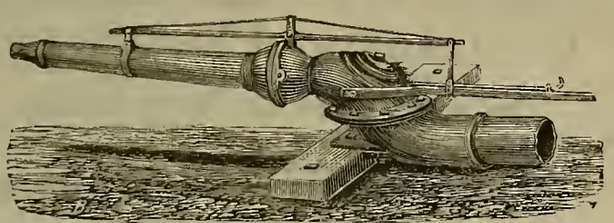
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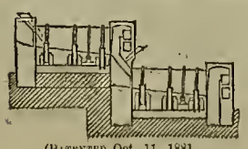
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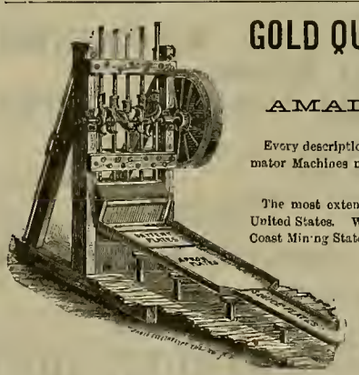
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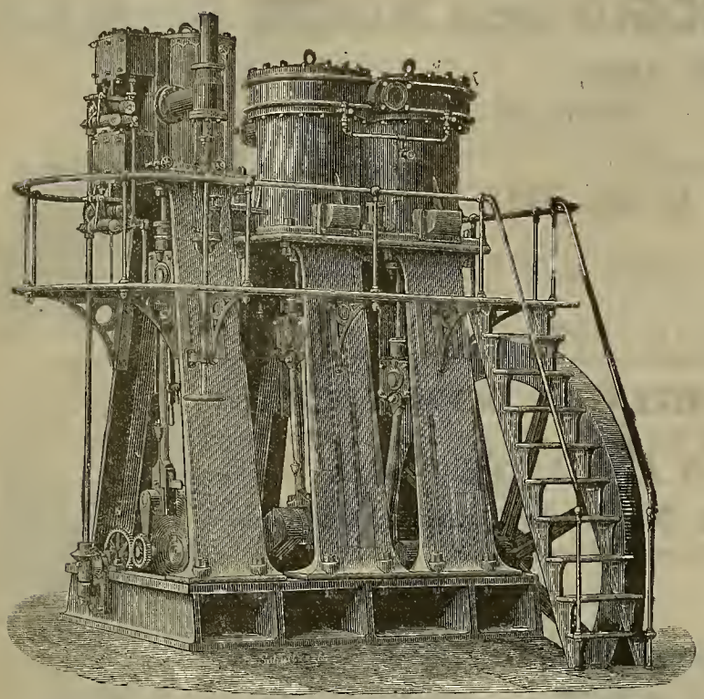
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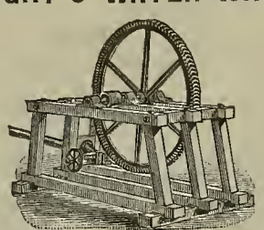
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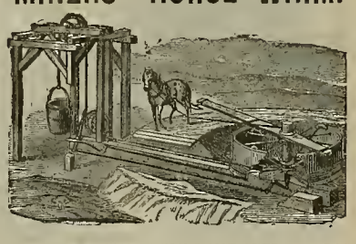
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SAN FRANCISCO, SATURDAY, SEPTEMBER 29, 1883.

VOLUME XLVII
Number 13.

Hurdy Gurdy Wheels.

A Record of Scientific Experiments.

Mr. Ross E. Browne, instructor in the College of Mechanics, University of California, has recently made some very careful experiments with hurdy gurdy wheels, which will be of interest to the mining community of this coast. The following article gives the results of these experiments and also a comparison of the efficiency of a Pelton wheel with that of the partial turbine.

These are commonly called "impact wheels," though such a name is misleading, and entirely loses its significance when the bucket is given its best form. When a jet of water strikes a stationary bucket shaped as shown in Fig. 12 or in Fig. 13, as soon as the motion has become permanent, the wedge-shaped portion of the water—shaded with horizontal lines—becomes practically stationary. We have actual impact only for a minute interval of time; *i. e.*, while the wedge is forming. After this the water is simply deflected in its course, and the bucket becomes almost instantaneously a pressure bucket.

When such a bucket is used for a wheel, it is plain that this shaded portion of the water is "carried," and must subsequently escape with nearly the full velocity of the bucket. Its useful effect is therefore very small, as compared with that of the water actually deflected. No advantage comes, then, from impact; on the contrary, serious losses are due to it.

The originally flat bucket (see Fig. 12) has been materially improved:

1st. By giving it curvature (see Fig. 13.)

2d. By filling in the wedge and making it a part of the bucket.

The second improvement brings us to the "Pelton wheel" (see Fig. 19), which is by no means an "impact" but distinctly a "pressure" wheel. By filling in the wedge, impact is avoided. The same thing in principle could be accomplished with the simply curved bucket, by having the jet strike one side instead of the center (see Fig. 14).

A prominent distinction between the Hurdy Gurdy wheel and the Partial Turbine rests in the fact that the former has "open" and the latter "closed" buckets. When properly constructed, the one is no more an "impact" wheel than the other.

The principal sources of loss in Hurdy Gurdy wheels are, in general:

1st. The energy remaining in the water after being discharged from the bucket.

2d. The heat developed by impact of the water in striking the bucket.

3d. The fluid friction of the water in passing over the surface of the bucket.

4th. The loss of head in the nozzle. The loss in the supply-pipe is not charged to the wheel.

5th. The journal friction.

6th. The resistance of the air.

In the formulæ below, all of these sources of loss but the first are neglected; and for the purpose of weighing the importance of curvature in the buckets, it is assumed that all of the water escapes from the bucket with the same velocity; *i. e.*, no water is "carried" with the wheel.

Let c designate the velocity of the bucket in feet per second;

v, the velocity of the jet escaping from the nozzle;

u, the relative velocity of discharge from the bucket;

w, the absolute velocity of discharge from the bucket;

Q, the quantity of water supplied per second in cubic feet;

γ, the weight of one cubic foot of water;

L, the useful work (in foot lbs per second) under the above conditions.

η, the efficiency of the wheel under the above conditions.

g, the acceleration of gravity.

δ, the angle made by the discharge end of the bucket with its line of motion (see Fig. 15).

Then, $u = v - c$

$$w^2 = u^2 + c^2 - 2uc \cos \delta$$

FIG. 12.



FIG. 13.



FIG. 14.



FIG. 20.

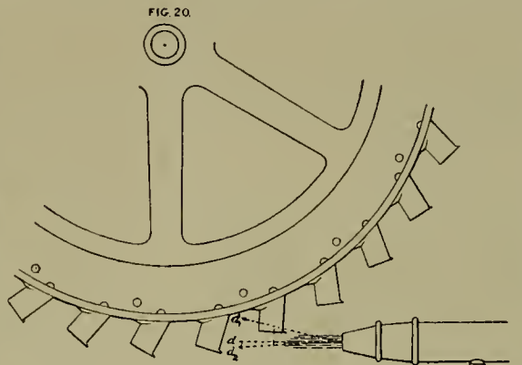


FIG. 16.

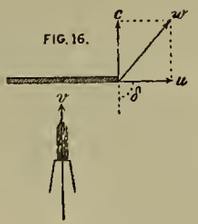


FIG. 19.

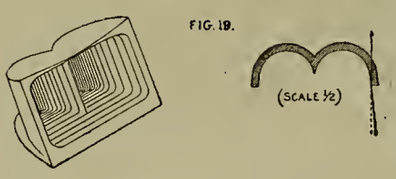


FIG. 15.

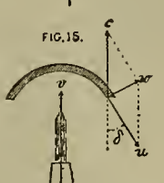


FIG. 18.

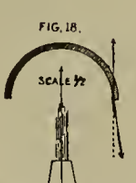
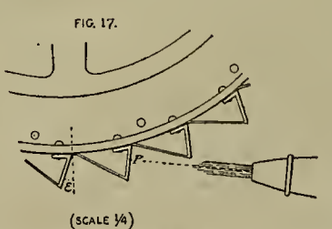


FIG. 17.



BUCKETS OF HURDY GURDY WATER WHEELS.

$$w^2 = v^2 - (2vc - 2c^2)(1 + \cos \delta)$$

$$L = \frac{Q\gamma}{2g}(v^2 - w^2)$$

$$L = \frac{Q\gamma}{2g}(2vc - 2c^2)(1 + \cos \delta)$$

$$\eta = \frac{L}{\left(\frac{Q\gamma}{2g}\right)v^2}$$

$$\eta = 2(1 + \cos \delta)\left(\frac{c}{v} - \frac{c^2}{v^2}\right)$$

And varying the velocity of the bucket, we have for the greatest efficiency—

$$\frac{d\eta}{dc} = 2(1 + \cos \delta)\left(\frac{1}{v} - \frac{2c}{v^2}\right) = 0$$

$$c = \frac{v}{2} \qquad (1.)$$

i. e., the velocity of the bucket should be one-half the velocity of the supply water (the jet) escaping from the nozzle; and this is not very materially modified by introducing the other conditions. Hence the greatest efficiency—

$$\eta_1 = \frac{1}{2}(1 + \cos \delta) \qquad (2.)$$

The smaller we make δ, the greater will be this efficiency.

Flat Buckets.—If the bucket is flat, $\delta = 90°$, hence $\eta_1 = 50$ per cent; *i. e.*, 50 per cent could not be reached with flat buckets, on account of the sources of loss neglected in these formulæ.

A series of experiments were made with such flat buckets (see Fig. 17), with a ¾-inch nozzle.

The curve of efficiency for various speeds, as established from these experiments, is shown in Fig. 23. A ¼-inch nozzle gave results but slightly differing from these.

The highest result was 40.4 per cent, under 50.2 feet head.

The velocity of the jet being approximately $v = .98\sqrt{64.36 \times 50.2} = 55.7$ feet per second, we should have for best efficiency, if the conditions were such as led us to equation (1), the velocity of point P of the bucket, $c = \frac{v}{2} = 27.85$. This corresponds to 6.8 revolutions of the wheel per second, which is marked by a heavy vertical line crossing the curve very near the point of the best efficiency actually obtained.

Curved Buckets.—If δ could be made = 0, we should have, under our assumed conditions, $\eta_1 = 100$ per cent; w would be = 0, and the water would simply fall from the bucket by its own weight. Evidently, then, δ should be made as small as is compatible with clearance of supply-jet and the following bucket. Experiments were made with such a bucket, as shown in Fig. 18 in section, in other respects shaped and set upon the rim of the wheel as the Pelton bucket (see Fig. 20).

A ¾-inch nozzle was used, under head of 50.4 feet. The best result reached was 65.6 per cent. The curve of efficiency is shown in Fig. 23. The heavy line crossing the curve again shows the best speed as calculated, by making $c = \frac{v}{2}$. This marks a speed about one-half revolution per second greater than that actually found by experiment.

The Pelton Wheel.—Mr. Pelton has kindly furnished a pattern from which buckets were cast, and 30 of them attached to the wheel, as shown in Fig. 20. A section and an isometric projection of the bucket are shown in Fig. 19. The angle δ is just sufficient to provide against interference of the discharged water with the buckets following.

The face of the bucket is inclined to the diameter of the wheel.

Experiments were first made with seven different settings of the nozzle. For direction d_1 (Fig. 20) of jet, the efficiency was 68.1 per cent, for d 80.5 per cent, for d_2 78.4 per cent. The nozzle was permanently set to give direction d to the jet.

The efficiency was then determined for various velocities of the wheel:

1st. With a ¾-inch nozzle, giving 82.5 per cent as the best result (see Figs. 21 and 23).

2d. With a ¼-inch nozzle, giving 75.6 per cent as best result (see Fig. 21).

3d. With a 7-16-inch nozzle, giving 82.6 per cent as best result*

Doubtlessly, the nozzle might have been increased to ½ inch without materially reducing the efficiency.

Another set of experiments was made with the ¾-inch nozzle, under various heads, from 50 feet down to 8 feet, showing a gradual decrease in useful effect (see Fig. 22).

At 8 feet, the efficiency still remained as high as 73 per cent. In experimenting with the "curved buckets," the efficiency might possibly have been raised 2 or 3 per cent by attending more carefully to the curve and to the size of nozzle used; still, there was probably a gain of more than 12 per cent due to the introduction of the wedge in the Pelton bucket.

In comparing the three Hurdy Gurdy wheels experimented with, it is evident, from Figs. 19, 13, and 12, that the "Pelton bucket" will "carry" the least, and the "curved bucket" the greatest quantity of water. This "carried" water is the most important of the sources of loss not taken into account in equations (1) and (2); hence the approximate best speed, as calculated from equation (1), differs least from the actual best speed, as found by experiment, in the case of the "Pelton bucket," and most in the case of the "curved bucket" (see Fig. 23). It is perfectly safe to say the Pelton bucket should have one-half the speed of the supply-jet for the best effect.

* In view of the fact that Mr. Pelton claims a still higher efficiency for his wheel, it should be stated that, although he furnished the pattern for the bucket, the wheel does not precisely conform in all particulars to his standard.

(See diagrams and comparison on page 201.)

CORRESPONDENCE.

The Denver Mineral Exposition.

[By our Traveling Correspondent.]

EDITORS PRESS:—In my former letter I took a few steps in the great exhibit, and introduced you to the big engine in charge of chief engineer Fitzpatrick, who has supervision of all the steam power of the establishment, mentioned a few of the mechanical exhibits, and further intimated that there were miles of tables and shelves, pyramids and piles of ores yet to be seen and worthy of mention.

Fine Arts.

But for fear I entirely forget it, I will first say the management have secured a rich treat for the students of art in the large display of paintings and drawings. Pictures? Yes, only pictures! But some of them represent a high order of talent, in the mental conception, and the executive skill of bringing that conception to a real external form for others to view. Next to this was exhibited the photographic specimens of grand views of noted sceneries and portraits of distinguished personages. The great French discoverer and inventor of this branch of art had scarcely a dream or shadow of the greatness or grandeur of his discovery, whose possibilities are yet unmeasured.

This art has given great assistance and encouragement to the art of painting. Passing along, we enter the floral department, where are arranged on stands and shelving the growing plants from the florists' gardens of the city, making a rich perfume that fills the air and seems to say, "A welcome to all." A large watermelon, a few choice native fruits and vegetables form a separate group. The choice cut flowers placed in elegant designs were not a trifling feature of this department. The premiums given in this branch alone already amount to nearly $300. The Commissioners seem to be lovers of fine arts, and believe in encouraging the culture of choice plants and also the art of placing them in a presentable, pleasing combination. We now pass by neatly fitted-up stands, showing

Various Lines of Business,

Each with its neat business card to offer. Here is a seller of mineral specimens and some fancy articles. Next is a large jewelry firm selling and showing up the excellencies of their "boss filled gold cases," several electric belt expounders, and a drug-manufacturing establishment with very fine samples of rare drugs and chemicals, as well as pyramids of fine toilet soap, representing the Denver soap works, and, passing right by the tent-makers' booth, the harness shop, the glove factory, the fur store, the sewing machine exhibits, and all the fancy exhibits of the high-toned Celestial Johns, the fancy card writers and card printers, the gunsmith's fullest outfits of weapons, fishing and hunting tackle, and curious and antique articles of interest.

We now enter a neat little apartment to see the perfect hatcher and a patent mother. The young man in charge, J. Telford, quickly assures us it is sure to hatch out his small plant of eggs in regular time. Near at hand is another hatcher—"Pomeroy's Automatic"—in charge of C. B. Chase. These Eastern inventions seemed to attract very little attention, for near them was an exhibitor of a gyroscope top, which, though a toy, would puzzle some old heads to understand why and how its rapid motion entirely counteracted the force of gravitation and enabled it to do various feats of balancing in the air.

Now, not to notice the cases of State natural history collections, and all the specimens of skeleton and stuffed and bottled reptiles and monstrosities, with rare fossils, relics and antique collections, we will here leave the gallery, conscious of missing the elegant bootbs of many large business houses of Denver, and also without stopping in and registering and getting good ice water at the editorial offices of the three Denver daily presses—*News*, *Republican* and *Tribune*. These great movers of public sentiment and torch bearers have their comfortable quarters in the gallery, where they can look down on the main audience floor, in front of the grand music stand and grand central fountain, and a little more distant see the agricultural pagoda, representing the farms of Colorado. This exhibition is not yet fully set in order.

Having now reached the bottom of the stairs and landed on the main floor again, we turn to the right, to a neat parlor with a cooled fountain of pure cold water, and enough good temperance literature and mottoes to show that this is the Women's Christian Temperance Union parlors. One visible

Effect of Their Mission Work

In this quarter is general sobriety, entire absence of all bars from within the building, and the fact that "the bar" on the outside had lately caused a heavy lattice-work to be erected in front of the open bar, to screen it from public view, as an experiment to see if it would not improve their business. Public sentiment has a weight that is felt for good, and to-day says, reformation is the first step needed in our progress. But we leave this temperance parlor and enter the main hall in the space allotted to the

Union Pacific Railroad Company.

For the exhibit of specimens of the products—agricultural, mineral and game—of the Territory passed over their roads. This exhibit occupies one mile in length of shelving, and everything is planted with care and with regard to convenience of visitors. The center of their allotment has a large spray fountain, over which is sprung a decorative arch. As a background to the shelving, on which were minerals, one carload of farm products, all kinds of grain and grasses were shown to good advantage and to give life-like appearance to the picture. The mounted heads of two deer, two elks, and two buffaloes were shown as just "coming through the rye." The mineral exhibit contained many specimens of mineral springs deposits from Idaho and various other medicinal springs; some very curious, where grass, leaves, mosses and bushes had been changed by action of mineralized waters to stone. There are fossilized fishes from fossil Wyoming, and petrifactions from Hams Fork, Green river. Some of this petrified timber has a hollow center thickly set with polished quartz crystals, some white and some amethyst-purple, etc.

Some specimens had right on the pure quartz some incorporated calcite cubes. One case of fine Colorado ores was shown, and two cases of petrifactions, and some gyserites from Yellowstone National Park. There are also samples from different mines at Wood River, Idaho. The J. Gould shows ores yielding 2,000 ounces silver, and 80 per cent lead. The May Flower has some about the same value. The Idahoan 75 per cent lead, 150 ounces silver; Bullion and Eureka about the same. Among other things shown are Elkhorn ore, cube galena, an 81-pound specimen with 160 ounces silver, and 75 per cent lead; one soft galena specimen weighing 50 pounds, gives 200 ounces silver, and 80 per cent lead. Some fine copper ore and nuggets of very fine copper, one of 80 pounds from Tie Siding, Wyoming. A hollow log 30 inches long with amethyst crystals for lining, from Amethyst mountain, Yellowstone Park. Next 4 large cases of crystals. From this casual glance it is evident that the railroad companies are alive to the importance of bringing the knowledge to the people—knowledge of the wealth-producing products of our own Territory. They show their faith in the country by building roads, and when built, they wish business for those roads, and therefore expend much to show the resources to the world. The well filled heads of grain and the tall corn speak volumes for the farming interest, while the mine workers will make a home market for much that is raised.

The Burlington Route Railroad

Have their grain exhibit in an alcove at the end of the gallery just over the Union Pacific Railroad exhibit. Their shelving has not been filled this season, but their six elegant grain samples, fifty apartment cases of last year, are still in place, and their various labored designs made of wheat heads, corn ears, grasses, etc., are yet looking well, and the various seeds bright and perfect in the cases.

The designer and executor of this exhibit deserved a diploma for excellence and the company credit for employing such talent. As we pass from the Union Pacific Railroad exhibit we encounter next the

Wyoming Exhibit.

Here we meet with a neat compact arrangement of a very grand display. Here stands an upright show case containing choice articles—fossils, gypsum, alabaster, mica sheets, gold, silver, copper, etc. But Wyoming is not satisfied to do fancy work. She piles up the substantial in bulk. Her coal pyramid 4x4, 14 feet high, large samples of granite and marble; sulphate of soda (Glauber salts), three feet by three feet, ten feet high, pure and white from Soda Lake, belonging to Union Pacific Railroad Company. Depth of soda in the lake, fifteen feet. Other locations in Wyoming have still larger deposits of bicarbonate of soda. One of them is reported as one mile long, half a mile wide and forty feet deep.

Graphite or black lead, kaolin, glass sand, mineral paint, irons, etc., were among their heavy exhibits. Then there were sulphur native, sulphate magnesia (epsom salts), asbestos, petroleum, to which add wool, furs and specimens of timber and firewood, and you can gather the range of this little territorial exhibit, but can add a pile of iron made at the rolling mills of the Union Pacific Company.

Their exhibit impresses every intelligent visitor with the fact that Wyoming has great resources, and an energetic pioneer population. In casting my eye or memory back on that exhibit, I recall one article I omitted to mention—a small section of petrified tree of rare beauty, about a foot long and nine or ten inches in diameter, hollow and with a perfectly crystalized quartz center set in a thin shell of opalized wood crystal, which was further incased in petrifaction, making nearly three inches shell. A portion of it was yet incased with an outside layer of sap, a portion of the former tree, now solid rock. The whole would perhaps weigh fifty or sixty pounds. This was much admired, so elegantly petrified and so plainly showing its original tree origin. With these abundant, varied and essential resources and the

Great Railroad Arteries

Of pulsation coursing through this Territory, what can hinder this great section from taking a front rank among the sisterhood of States? It seems as if no element is lacking in the catalogue of her resources for a wealthy and independent community.

The liberal terms of all the railroads in bringing articles to be placed on exhibition has contributed much to the success of this national exhibit. This shows the practical good sense of the railroad managers. They use every honorable means to advance the interests of the Territories through which they have built their roads with their various branching lines. They have brought passengers from St. Louis and other and more distant places, to Denver and return for very low figures, and while here, they have availed themselves of cheap excursion rates to see New Mexico and Colorado. I met some of these at the fair. They appreciated the grand opportunity of seeing so much of the mining ores gathered at one place for convenient exhibit and comparison. Even old Mexico filled a show case with very grand samples of rich silver and gold specimens. Massive silver, wire and moss silver, and leaf silver, also crystalized arborescent specimens of gold from our neighboring States of old Mexico, through which now are two of these great thoroughfare railroads. The Sonora railroad from Guaymas on the Gulf of California, to connect with the Southern Pacific Railroad at Benson, in Arizona. Also the Great Central Mexican railroad joining the Atchinson, Topeka and Santa Fe railroads at El Paso, running 224 miles to Chihuahua, Mexico, where now new energy is taking hold of the old mines, and with the aid of steam transportation instead of the "burro," and all the modern helps to sink deep, and extract cheaply the bullion from the ore, we can but expect an early change in all that Western Mexican life. The better class welcome the new order, and the other classes have not energy enough to oppose a live progression.

Denver, Col. B. W. CROWELL.

Grass Valley and Its Mines.

[From our Traveling Correspondent.]

EDITORS PRESS:—During the past week I have been about this pretty mountain town to a considerable extent, and have gained thereby a general knowledge of its situation and surroundings. I am not going to write its history; only jot down a few items concerning its pleasing features, and also to give you a few brief and concise notes of the mines in this vicinity. The business portion of the town is compactly built, but, like most of the interior and mountain towns, the buildings are the major portion of wood and one-story in height, presenting the usual square gable end to the street. There are, however, many exceptions to this general rule in the business portion of the town. Here there are very many well built and expensive buildings of two stories, constructed of brick and iron, and meant to be to a certain degree fire-proof. The streets are evidently laid out to suit the topography or configuration of the town-site. These run in almost any direction and anywhere. I do not mean to say by this that the streets run like "sheep paths," but to a stranger, at least, they appear considerably "criss-cross," but, nevertheless, are well suited to the hilly nature of the town-site and to the convenience of the inhabitants. The streets abound in artificial shade trees, the white locust and poplar predominating, and so general are these trees that the town seems embowered in them, and presents to the eye a cool and inviting aspect. In the private dwellings of the people the stranger finds most to admire, the neat cottages painted white with their verandas, over which are trailing vines, shading and hiding them almost from view, large and ample yards filled with fruit trees, and vines, and flowering plants and shrubs. How rosy a look they all have; hardly an exception, rich or poor, the owner may be! They seem like birds' nests hidden away among trees and vines. Surely, there ought to be much of happiness to the mates who dwell therein, and I can hardly see how they can help "cooing to each other all the live long day," for the beauty and comforts about them and theirs. They can of a verity sit under their own vine and fig tree with none to molest or make them afraid.

The town is alive with children. I have heard it said, by the people here "that we hardly know where they all come from," (Dame nature, I think, is wiser than they, and could answer the query if she would), "that are in daily attendance at the public schools." The average is about 1,000. The school buildings are commodious and comfortable. The teachers competent and faithful in the discharge of their duties. The churches of the different denominations have attractive and comfortable places of worship, and are generally well attended. The town has an excellent water supply, pure and soft, ample for domestic uses, irrigation of yards and gardens, sprinkling of streets, and use in case of fire. Hydrants to which hose may be attached are at every corner of a block; the pressure being sufficient to throw water high enough for purposes. The town has a well drilled, and thoroughly organized fire brigade, hook and ladder company. Gas is manufactured and furnished to the town for street lighting, and to the citizens who choose to use it.

The Mines in This Vicinity

Are all looking well, and there is apparent a spirit of hopefulness and confidence expressed by all classes of citizens in the stability and continued output of the old mines, and that many new enterprises lately begun in mining will, in a short time, develop paying properties, and that are more than likely to prove the peer of any now working in this district. The Idaho still holds its prestige as the first mine here. It continues to yield the precious metal as of yore, and probably will for many years to come. I need not write of the new and expensive improvements made in the mill and mine by the introduction and use of water power, or of its economic advantages to the company. All this has been but lately given to the public through the columns of your paper and its illustrations. The average output of ore from this mine is about 100 tons per diem. The results of the working of the ore is, I am told, entirely satisfactory to the management and stockholders, and fully equal to any former production.

The Original Empire Mine

Is situated at a locality about one mile southeast of the town of Grass Valley, known as Ophir hill, and was at one time in its history called the Ophir mine. By the invitation of Mr. McKay, the superintendent of the mill and mine, I was allowed the privilege, and in his company of inspecting the working of the mill. The ores of the mine, the dumps, and hoisting machinery together with the improvements now being made in the putting in of new batteries, and the reconstruction of the old mill building, and the necessary addition thereto for the accommodation of the new batteries and self-ore feeders; the raising of the hoisting landing at the mine's shaft, so that the ore raised can be delivered directly to the rock-breaker and ore feeder with the least handling possible, and to the batteries with very small expense of labor. So great and general are the nature of the improvements that they are nearly equal to the building of an entirely new mill, and when completed will constitute "The Old Empire," one of the best appointed mills for the economic and close working of gold ore of any in the State. The output of the mine is steady and profitable, and consequently pleasing to its owners. The mine gives employment in all its departments to a force of 200 men. Outside of these there are working in various parts of the drifts of the mine, and at the surface on small veins or feeders to the main vein; some thirty men as "tributers." This manner of working is said to be profitable to both owners of mine and miners, the former buying the ore at an agreed per cent of the latter. This mine is said to be now in better shape, and to have a brighter showing than at any time before for thirty odd years past, from what I saw I believe that its future is well assured. The management is energetic and able, and its executive officers at the mine appear to be capable, efficient, and prudent in the direction of the mine's affairs.

The Magenta Con. Mine.

This location and mine is not new to fame. It has, like many others in this vicinity, had its "ups and downs," and "black eyes," and in its case, as also in the history of others as well, the fault has not always been chargeable to the mine itself, but has come largely from missmanagement, not to say fraud, for I hold and know from my experience in mining, that a mine can be as easily defrauded out of a good name as an individual, and I doubt not but that many a mine in this and other districts have been so defrauded to their ruin. A mine needs to be dealt with honestly by to flourish, as well as a man. I don't know of very many "black eyes" that mines receive in any other way. A mine may loose its vein or ore, and generally when honesty, perseverance and intelligence have ruled a mine the output is more than likely to be renewed sooner or later. The above mine is said to be a continuation of the Ophir lead. The general character of the rock and ore extracted is the same both in color and granulation of the quartz. A working shaft has been sunk to a depth of 365 feet, following the vein with good rock ore or ore in sight the entire depth. The shaft is double compartment, and thoroughly timbered in a manner to admit the running of cages, pumping machinery and hoisting works, which are now being put up preparatory to the resumption of work and the sinking of shaft to a depth of 1,000 feet. The mine has the confidence of the people here, many of whom are stockholders. Miners at work in the mine also hold largely of the stock. I am told by the superintendent that that within one month after the hoisting works are completed it is expected that the ore then extracted will pay all expenses, and that in time it will rival in its output and dividends "the original Empire and the Idaho mines." The average value of ore that has been extracted in former times was from $26 to $32 per ton. The prediction here is that the Magenta will soon become as profitable and famous as its neighbors.

The Dyer Cannon Ball Quartz Mill.

Among the many mechanical devices presented to the mining public for favor and patronage, the above-named mill is worthy of the attention and investigation of mine owners, superintendents, millmen and others who are interested in the working of gold and silver ores. Your correspondent, having had an opportunity of seeing the machine at work at the "Brunsteter mill," in the town of Grass Valley, believes that it possesses many substantial qualities to recommend it to favorable inspection. Wherever now in use, this mill is giving entire satisfaction. I do not desire or intend to discuss its merits or demerits as compared with those of the stamp mill; the inventor and the manufacturers are able and willing, and probably anxious, to do that. I will, however, venture to say this much in its favor, admitting that other conditions are equal as to effectiveness, capacity, durability, etc. It has at least one great advantage over the stamp battery, viz.:

(CONCLUDED ON PAGE 198.)

MECHANICAL PROGRESS.

The Displacement of Iron by Steel.

Although the tendency to substitute iron for steel may seem to be a hackneyed subject, there are new phases constantly presenting themselves which are worthy of notice. The prophecy has been freely made during late years, that, in a comparatively brief period, the use of iron as a finished product would be restricted to a very limited field, if not altogether abandoned. From about 1876 to 1878 steel gained very rapidly on iron, especially in England, where many new steel works were erected and many iron works were adapted to the manufacture of steel. At that time the iron business all over the world was more depressed than the steel trade, and the end of the use of finished iron seemed to be near at hand. But the last four years have witnessed a decided reaction. The demand for iron revived, and up to a very recent date was in excess of the demand in any former years. Now the hunger for iron has been appeased, and in almost every part of the world the consumption of iron is less than it was a year ago. And here comes the fact which has a direct bearing on this subject, and causes these reflections on the displacement of iron by steel—the consumption of steel appears to have fallen off as much as that of iron.

There is as yet but one line which steel has monopolized, and that is the rail trade. Steel is fighting hard in other fields, but the battle is hotly contested, and the odds are only occasionally in its favor. Steel boiler plates are quite extensively used, but the demand for iron boiler plates has increased in recent years, and the inroads of steel have not been marked by the closing up of iron plate mills.

The production of steel wire has greatly surpassed that of iron wire, but there are grounds for believing that for certain purposes iron wire will always be needed, and that its production must necessarily increase with the growth of these needs, which are in their nature progressive. The use of steel plates for ship-building is unquestionably increasing, but it has not kept pace with the great increase in maritime construction in Great Britain, the shipyard of the world, where more iron plates than ever have, in the recent ship-building "boom," been used in the construction of hulls.

There is a growing demand in England and Wales for steel sheets for tinning purposes, but sheet iron has by no means been supplanted in the manufacture of tin plate or in other lines, either in Great Britain or in this country. Our sheet iron mills have been pressed with orders for years past. The use of bar iron has been unaffected by steel, although efforts have been made to introduce steel for special purposes in direct competition with it. Carriage tires are now made principally of steel, but that is not a trade of very large proportions. Steel beams are occasionally asked for, and there are some shapes which can be made as cheaply of steel as of iron; but general structural forms are almost invariably made of iron. Steel car axles are more widely used every year, but the manufacture of iron axles exhibits no sign of decay. The use of steel castings is becoming more diversified with the advance of time, but the steady demand for foundry pig iron shows that there is still a very large market for iron castings. Steel shafts and forgings are more common than they were some time ago, but they have not completely taken the place of iron forgings, which are still turned out in considerable quantities all over the country.

There is no doubt that the use of steel is growing, and that larger quantities will be used in the future than in the past, but the prophets who have peered so deeply into the future and have so vividly seen the immediate coming of the age of steel have been disappointed in the results so far accomplished. Iron has stubbornly refused to be forced out of use, and the indications are very favorable to the assumption that the country blacksmith, the carriage maker, the car builder, the machinist, the iron founder and their multitudinous co-laborers will continue to use iron for an indefinite period.—*The Iron Age.*

A NEW AND WONDERFUL GUN.—At a lecture lately delivered at the Civil Service Institute in London, Colonel Fosbery created a sensation by suddenly drawing from its place of hiding, under the table, a wonderful new gun, which he had just brought from Liege. He called it a "baby electric gun." It looked like a pretty carbine, but it had no mechanism, and could not possibly go off until connected up to the source of electric force. This done, it could be fired with amazing rapidity, 104 rounds having a few days before been fired from it by its inventor, M. Pieper, of Liege, in two minutes. Col. Fosbery fired two rounds with infinitessimal powder charges. He had prepared himself by secreting under his vest a small circuit of wire and putting on a banderole, supporting what looked like a two-ounce vial, but was, in fact, an electric accumulator, with sufficient stored-up energy to discharge 2,000 rounds. The cartridges were innocent looking mites, and contained no detonating substances—nothing, in fact, but simple powder and a wad.

COMPOSITE NAILS.—The Boston *Commercial Bulletin* learns that the manufacturers of the composite, or as many call them, the iron-clad nail, are meeting with no little success in introducing them to the trade. The composite nail was put upon the market about six months ago. They are made solely by one of the leading nail companies of this State under Wheeler's patent. The nails are practically of steel with an iron outside. They are intended for the same purposes as steel nails, and the manufacturers claim that they are fully as effective for every service as steel nails. They have several advantages over the latter, the most important being that they can be produced cheaper. Whereas, steel nails cost one dollar per keg over the ordinary nails, the composite nails cost only fifty cents more. Steel nails when of good quality have to be manufactured from steel blooms, while in the manufacture of composite nails the iron covering protects the steel from deoxidation, and so scrap steel can be used. Then the iron covering is much easier on the nail making machinery than steel. This is a very important item in the economy of production.

DRIVING MACHINERY BY SAND.—A Western exchange gives an interesting account of the method recently adopted by Mr. J. Townsend, of Virginia City, to run a number of arastras by sand. The arastras are placed in a light sandy field where only sufficient water for drinking purposes and to moisten the ore to be operated upon can be obtained. The sand drives a large overshot wheel, taking the place of water. It was at first Mr. Townsend's intention to run the arastras by means of a large windmill, but as the speed was naturally irregular he adopted the present method. The windmill now runs a belt containing a number of buckets, and these carry sand up to a large tank somewhat in the way that grain elevators carry wheat. A stream of sand being let out upon the overshot wheel causes it to revolve, just as it would under the weight of a stream of water, and thus far the method is said to have been found very successful. When there is considerable wind, sand is stored up for use when calms prevail, and in this manner the mills may run continuously.

SETTING EDGE TOOLS.—In using the chisel and in setting edge tools for work that needs to be finely finished, the most common mistake made by beginners is to use it too long before resetting the edge on the oil stone. Suppose that half an hour's work shortens the blade, as measured by the exact cutting edge, by 1-200 of an inch? To bring the edge once more to its original keenness requires a certain amount of rubbing on the stone, the amount corresponding to 1-200 of an inch on the flat face. In ten minutes' work the blade will be shortened by, say about one-third of 1-200 or 1-600 of an inch, and the amount of rubbing to bring back the edge to the original sharpness after this amount of work is not more than one-third of that needed in the first case.—*Age of Steel.*

UTILIZING SAWDUST.—There is good reason to believe that sawdust will eventually be found of some better service than that of choking up and polluting the waters of our rivers. It has already been applied to several purposes in a compressed form, and we now learn of a still new use to which it has been put. An exchange says: Pine sawdust, highly compressed, has been successfully used to make up center frames of carriage wheels. It is said to be so solid that it will bear a pressure equal to twenty-three tons per square inch. As sawdust has also been used for partitions and bricks, its application to the production of complex carvings and moldings does not seem to be far off.

DISCOVERY OF THE CEMENTATION PROCESS.—It is considered highly probable that the discovery of the cementation process for making steel had its origin in Liege, Belgium. At the commencement of the 17th century, in 1613, a permission to convert iron into steel is found to have been officially accorded to two armorers of Maestricht, a town which then belonged to the Province of Liege. Judging from this, the metallurgist, Karsten, was probably correct in saying that "England, which has now become the school of iron metallurgy, owes to the Continent two great discoveries—namely, that of the blast furnace and that of cementing steel."

ARTIFICIAL stone is by no means a modern discovery. To-day nothing of the burnt bricks of the ancient Egyptians, Scotland, England, Ireland and Wales contain numerous veins of concrete in the old castles of those lands. The Moors have also left samples of their artificial stone upon the rock of Gibraltar, which, have withstood the fury of the climate for over ten centuries. The cisterns of Solomon, near Tyre, erected by that potentate are in almost complete preservation. Many other similar relics are found in other Eastern countries.

JOURNAL boxes are now made which retain the oil, and require replenishing only three or four times a year. Pouring oil on a heated journal is wasteful; water is much better, and is at any time a good lubricant, so long as it retains its place between the journal and the box. Oil, after passing between a heated journal and box, is comparatively worthless for lubricating purposes.

THE AUTUMN MEETING of the British Iron and Steel Institute will be held on the 18th, 19th, and 20th of September, at Middlesboro'.

SCIENTIFIC PROGRESS.

Origin of Nitrogen.

The authors, A. Muntz and E. Aubin, show that the only noteworthy agent for the production of nitric or nitrous acid from the free nitrogen of the atmosphere is the electric discharge. They consider that unless the supply of the oxides of nitrogen thus generated is greater in tropical regions than it has been found to be in Europe, it will be difficult to explain, by electricity alone, the compensation of the nitrogen which is incessantly wasted, and especially the accumulation of combined nitrogen which exists on the surface of the globe. Hence, another cause must be sought for the production of nitrogenous compounds. It has been proved by the experiments of M. Boussingault upon plants, and those of M. Schloesing upon the soil, that neither of these are able to assimilate free nitrogen. Hence, the authors are inclined to seek the source of combined nitrogen in the violent combustions which must have ensued at a certain stage of the earth's existence, when the elements which had been dissociated by an elevated temperature recombined in presence of oxygen and nitrogen, involving the formation of nitrous compounds. It is known, indeed, that large quantities of nitrous acid are formed whenever any body is burnt in air.

According to the authors' experiments, 1 grm. of hydrogen burning in air yields as much as 0.001 grm. nitric acid, while 1 grm. yielded as much as 0.100 grm. Hence, at the first appearance of organic beings upon the earth, there existed a large stock of nitrogenous compounds in the air and the soil upon which we are still subsisting, and which is decreasing under the influence of the causes which effect the escape of free nitrogen, unless the supply is kept up by the action of atmospheric electricity.

COLORING FLOWERS BY ABSORPTION.—We last week gave a short item, which is going the rounds of the papers, in regard to the coloring of flowers by absorption, of which a Mr. Nesbitt, an Englishman, claims to be the discoverer at a recent date. A correspondent of the *Scientific American*, of September 22d, puts in a counter claim, as follows: "In the last number of the *Scientific American*, under the heading 'Flowers Colored by Absorption,' it is stated that 'the process of coloring flowers by the absorption of dyes through the stem' is the discovery of Mr. Nesbitt. Two years ago Mr. C. B. Riker showed me several field daisies colored by placing their cut stems in aniline violet ink. They refused to absorb any color from black ink. Mr. J. M. Foote, of Newark, made experiments of a similar nature twenty years ago, which are even more curious, inasmuch as he colored peonies, as they grew by applying various dyes in solution to the ground in which they stood, obtaining five or six different colors, and also finding them to refuse certain colors. Both the above experiments probably antedate Mr. Nesbitt's.

MODIFICATIONS OF GLASS AT MODERATE TEMPERATURES.—Some interesting communications relative to the changes which thermometers undergo when they are heated for a long time were recently presented to the French Academy. It appears from these that in manufactories of printer's ink, where oils are heated to a temperature of 538° F. for many days, the most accurate thermometers often become so changed as to indicate errors of 10 or more degrees. J. Salleron calls attention to similar changes at much lower temperatures. The areometers, which are employed in sugar refineries where molasses is treated by osmosis, are plunged for many days in liquids which are heated to 203° F. Although this temperature is below the boiling point of water, it is sufficient to completely modify the areometers and to soften the glass enough to make them untrustworthy.

A NEW FUEL.—A Mexican paper gives an account of a new fuel recently brought out in the City of Mexico. The article is called "turbato," and consists principally of bog peat, of which there are immense quantities in Mexico, mixed with a proper proportion of bitumen. The fuel is made for locomotives, stationary engines, smelting purposes, smiths' fires and household purposes. It is said to burn freely, and without much smoke, giving a higher dynamic equivalent of heat than the same amount of wood. It can be manufactured and sold in Mexico at a price considerably below coal or wood, and, looking at the daily increased demand for fuel, the augmentation in the price of wood and its growing scarcity, a large and successful market is considered in store for "turbato."

EXTRAORDINARY DISCOVERY.—The English papers speak of an extraordinary discovery which Dr. Brown Sequard claims to have made. It is an anesthetic which suspends sensation without affecting either consciousness or activity, and may be used for a day, or for a longer period with impunity. In other words, he has "invented" a drug which will enable a sick person to perform all the natural functions and to assist in his own cure without enduring any pain. The exhaustion which comes of intense suffering will be put an end to; but there will be no suspension of those activities the exercise of which are necessary to recovery.

A NEW ILLUMINANT.—Lieut. Diek, of the Russian army, is said to have discovered a new illuminating substance which is capable of imparting luminous properties to objects to which it is applied. It is in the form of a powder, and of three colors, green, yellow and violet, the latter being the most powerful. Water in a glass vessel is by this means converted into an illuminating fluid. In a lecture recently delivered by the inventor of the Nicolai Engineering Academy, at St. Petersburg, he explained the application of the substance to military and industrial mining operations. The illuminating power lasts for eight hours, and the powder must then be renewed. The German Government is said to have lately been making experiments with Lieutenant Dick's invention.

INFLUENCE OF HEAT ON THE PERMANENT MAGNETISM OF STEEL.—According to the *Chronique Industrielle*, some interesting experiments relating to the influence of heat on the permanent magnetism of steel were recently made by Professor Poloni. He finds that the diminution of magnetic intensity by the increase of temperature in the steel bar has no rigid relation to the increase of electric resistance in the metal itself. While the permanent magnetism diminishes with increasing rapidity up to a temperature of 328° F., and then less rapidly up to 508°, becoming inappreciable at red heat, the electric conductivity of the iron diminishes uniformly with the increase of temperature.

LIGHT STANDARDS.—M. Monnier, director of the laboratory installed at Paris (by the gas companies) for the study of electricity, has undertaken a comparison of the existing standards of light. He finds the value of the French carcel to be in English standard candles 8.33; in German candles, 7.5; in Munich candles, 6.5. The standard equivalent values of those in vogue are, for the English, 9.5, and German, 7.6; therefore, some change in this respect would seem to be advisable. Schilling's equivalents to the carcel are, English, 9.6; German, 9.8, and Munich, 8.7. On the other hand, Schilling's measurements give the corresponding values as 7.77, 7.4, 8. 7.

POSSIBLY SO.—Two aeronauts, a Belgian and Frenchman, have recently succeeded in accomplishing the feat of crossing the English Channel in a balloon, so often unsuccessfully attempted. In his account of the voyage, one of the participants says: "Not only the land lay below us like a map, but the bottom of the sea was clearly seen in all directions; every channel and shoal was easily marked, and formed a fibrous network. By the aid of instantaneous photography and the balloon, our knowledge of the sea could be very greatly increased; charts of greater exactness than any existing could be made of the bottom of the sea, at least of shoals shallow enough to offer danger to sailing crafts."

IMPORTANCE OF GREEK AND LATIN.—President Seelye, of Amherst College, says that a four-years' scientific course was organized which a student could pursue with no knowledge of Greek and only a slight knowledge of Latin. After an experience of ten years it has been found that the best scientific students have, in every year, without a single exception, been the classical students, and the college has become so thoroughly convinced that the best work in science is to be done only on the basis of a thorough grounding in the classics that it has discontinued its scientific as separate from its classical course.

EARTHQUAKE RESEARCHES.—A Yokohama paper states that Mr. John Milne, whose researches on earthquakes, as explained by him to the British Association at Southampton, have excited a great interest in scientific circles, and who has since returned to his duties in Japan, has applied to the Japanese authorities to establish an observatory, in order that he may be able to thoroughly investigate underground phenomena. He has sent the authorities a long treatise upon the earthquakes of Japan.

PROF. SIR W. THOMSON, in his new treatise on natural philosophy, is led, by a consideration of the necessary order of cooling and consolidation of the earth, to infer that the interior of our world is not, as commonly supposed, all liquid, with a thin, solid crust of from twenty to one hundred miles thick, but that it is on the whole more rigid than a continuous solid globe of glass of the same diameter, and probably more rigid than such a globe of steel.

A STRONG ELECTRIC LIGHT.—Probably the strongest single electric light now in this country is suspended in front of the *Record* building in Philadelphia, some 90 feet above the level of the street. Its power is equal to that of 10,000 candles.

A NEW FLUX.—A French metallurgist, M. Brunow, claims to have discovered a reducing substance which so promotes liquefaction that by its aid he has melted pig iron in fourteen minutes.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alaska M Co	California..	3..	1 00..	Aug 22..	Sept 24..	Oct 13..	A Judson	320 Sansome st
Bodie Con M Co	California..	3..	50	Aug 4..	Sept 10..	Oct 10	G W Seasons	309 Montgomery st
Best & Belcher M Co	Nevada..	27..	50	Sept 18..	Oct 24..	Nov 16..	William Willis	309 Montgomery st
Con Amador M Co	Nevada..	6..	50..	Sept 15.	Oct 20..	Nov 13..	F B Latham	408 California st
Campo Seco Copper Co	California..	2..	10..	Aug 10.	Oct 1	Nov 20..	D Buck	309 Montgomery st
Chollar M Co	Nevada..	12..	1.00..	Aug 2..	Sept 6 ..	Sept 28..	W E Dean	309 Montgomery st
Day & M Co	Nevada..	13..	30	Sept 7..	Oct 15..	Nov 12..	E M Hall	327 Pine st
Double Standard M Co	California..	6..	10..	Aug 30..	Oct 5..	Oct 25..	G W Seasions	309 Montgomery st
East Mt Diablo M Co	Nevada..	3..	05..	Aug 13	Sept 17	Oct 8..	G W Fisher	306 Pine st
Eintracht Gravel M Co	California..	13..	05..	Sept 11	Oct 17	Nov 5..	H Knuz	209 Sansome st
Eureka Con M Co	Nevada..	6..	1.00..	Sept 23..	Oct 22..	Nov 12..	P Jacobns	309 Montgomery st
Excelsior Water and M Co	California..	5..	60..	July 6..	Sept 15..	Oct 6..	W J Stewart	218 Sansome st
Gorilla M & M Co	California..	2..	21..	Aug 23	Oct 3..	Oct 31	A A Emquist	436 Montgomery st
Hale & Norcross M Co	Nevada..	78..	50..	Sept 11.	Oct 16..	Nov 6..	J T Lightner	309 Montgomery st
Homer M & M Co	California..	3..	10..	Aug 2..	Sept 8..	Oct 2..	F E Luty	330 Pine st
Luna Con M Co	Arizona..	7..	05..	Aug 6..	Sept 10..	Oct 6..	R D Hopkins	436 Montgomery st
Martin White M Co	Nevada..	16..	25..	Sept 22..	Nov 7..	Dec 6..	J J Scoville	309 Montgomery st
McClinton M Co	California..	9..	05..	Aug 30..	Oct 4..	Oct 24..	G W Sessions	309 Montgomery st
Mexican M Co	Nevada..	24..	1.00..	Sept 17.	Oct 23..	Nov 13..	C L McCoy	309 Montgomery st
North Gould & Curry M Co	Nevada..	5..	25..	Aug 9..	Sept 11	Oct 1..	C H Mason	331 Montgomery st
Pleasant Valley M Co	California..	2..	15..	Sept 8..	Oct 16..	Nov 3..	C E Elliott	327 Pine st
Potosi M Co	Nevada..	13..	50.	Aug 13.	Sept 17..	Oct 8	W E Dean	306 Montgomery st
Ruby Hill Gravel M Co	California..	9..	25..	Sept 3..	Oct 20	Nov 12	H Pecham	320 Sansome st
Sierra Nevada M Co	Nevada..	7..	77..	Aug 9..	Sept 12..	Oct 2..	E L Parker	309 Montgomery st
Silver Hill M Co	Nevada..	19..	05..	Sept 3.	Oct 8..	Oct 30..	W E Dean	309 Montgomery st
San Miguel & Trinidad M Co	Mexico..	3..	1.00..	Sept 8..	Oct 11..	Oct 19..	C G Brooks	210 Front st
Trinity G M Co	California..	1..		Sept 15.	Oct 22..	Nov 6..	L Wadham	528 California st
Tip Top M Co	Arizona..	7..	25..	Aug 16.	Sept 24..	Oct 22..	H Deas	309 Montgomery st
Winthrop M Co	California..	1..	25..	Sept 17.	Oct 23..	Nov 16..	H Wright	410 Front st
Yaqui M Co	Mexico..	2..	10..	Sept 12.	Oct 17..	Nov 7..	T T Atkinson	337 Pine st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Exchequer M Co	Nevada..	C E Elliott	327 Pine st	Annual	Oct 15
Detroit Copper M Co		J Elbert	331 Montgomery st	Annual	Oct 1
Mono Lake Hydraulic Co	California..	J Elliot	331 Montgomery st	Annual	Oct 1
Oro M Co	Nevada..	J Greenwood	320 Sansome st	Annual	
Peabody M Co	Nevada..	R D Hopkins	436 Montgomery st	Annual	Oct 12

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Bulwer Con M Co	California..	W Willis	309 Montgomery st	15	July 2
Kentuck M Co	Nevada..	J W Pew	310 Pine st	10	July 19
Mt Diablo M Co	Nevada	R W Heath	318 Pine st	25	Sept 25
Standard Con M Co	California..	Wm Willis	309 Montgomery st	25	Sept 12
Silver King M Co	Arizona..	J Nash	315 California st	25	July 12

Table of Highest and Lowest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Sept. 5.		WEEK ENDING Sept 12.		WEEK ENDING Sept 19.		WEEK ENDING Sept. 26.	
Alpha	2 10	2.00	2 15	2.10	2.55	2.00	2.30	
Alta	.80	1.10	.85	1.50	1.00	1.50	1.60	1.60
Andes	.70	.75	.70	.75	.60	.70	.50	.70
Albion	....	....	....	.40	....	.45	....	.45
Argenta	.20	.30	....	.15	....	....	....	....
Atlas	....	....	....	....	....	....	....	....
Belcher	1.00	1.05	1 00	1.10	1.05	1.15	1 00	1.05
Belding	....	....	....	....	....	....	....	....
Best & Belcher	4.20	4.50	3.75	3.20	3.35	3.75	3.20	3.60
Bullion	1.00	1.10	.90	1.00	1.00	1.05	....	.85
Bechtel	....	....	....	....	....	....	....	....
Belle Isle	....	.25	....	.35	....	.30	....	.30
Bodie Con	.15	.25	.15	.55	.65	.95	.55	.60
Benton	.20	.25	.20	.30	.20	.25	.25	.30
Bodie Tunnel	....	....	....	....	....	....	....	....
Caledonia	....	....	....	....	.20	.25	....	.25
California	.30	.40	.20	.30	.10	.20	....	.15
Challenge	....	....	....	.35	.35	.40	....	.35
Chollar	2.70	3.20	2.00	3.10	2.75	3.15	2 70	3 05
Confidence	....	.35	1 90	2 00	....	1.85	1.60	1 80
Con. Imperial	....	....	....	.10	....	....	....	....
Con. Virginia	.65	.75	.55	.60	.45	.55	.45	.55
Crown Point	....	1.15	1.10	1.20	1.20	1.40	1.10	1.20
Dey	....	....	....	.50	....	....	....	....
Elko Con	....	....	....	....	....	....	....	....
Eureka Con	6.75	7.25	6¼	7¼	6.00	7.00	....	5.75
Eureka Tunnel	....	....	....	....	....	.15	....	....
Exchequer	.60	.65	.55	.65	.60	.63	.55	.65
Grand Prize	....	.25	....	.20	....	.10	.15	.20
Gould & Curry	3.10	3.25	2.40	3.05	2.30	2.75	2 20	2 60
Hale & Norcross	5¾	6¼	3.70	4.95	3.70	4.10	3.55	4.10
Holmes	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	.05	.10	....	.10	....	....	....	....
Justice	.30	.40	.35	.65	.40	.50	.40	.55
Jackson	....	.50	....	....	....	....	....	....
Kentuck	....	....	....	....	....	....	....	....
Martin White	....	....	....	....	....	....	....	.10
Mono	....	....	....	....	....	....	....	....
Mexicana	3.65	3.85	3.45	3.50	2.50	3.20	2.25	2.75
Mt. Diablo	4.15	4.25	3.25	4.50	4.00	4.60	4.25	4.75
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	....	....	....	....	....	....	....	....
Northern Belle	....	6¼	6.00	6.75	6.00	.6¼	....	6.00
North Noonday	....	....	....	....	....	....	....	....
Navajo	2.95	3.00	2.80	2.90	....	2.60	....	.60
North Belle Isle	....	....	.55	.60	....	.45	....	.45
Occidental	....	....	....	1.50	....	1.50	....	....
Ophir	3.05	4.00	3.45	3.70	3.30	3.70	3.25	3.70
Overman	....	....	....	.35	.40	.45	....	.40
Oro	....	....	....	....	....	....	....	....
Potosi	1.05	1 20	.75	.90	1.05	1.20	1.00	1.15
Pinal Con	....	....	....	....	....	....	....	....
Savage	2 40	2.60	1.85	2.20	1.75	2.05	1.65	2 00
Seg. Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	3.75	4.30	3.10	3.95	3.50	4.15	3.60	4.35
Silver Hill	....	.20	....	....	....	....	....	....
Silver King	7.00	8.00	....	8.00	7.5	4.00	....	7.50
Scorpion	.60	.65	.55	.60	.60	.65	.60	.65
Tuscarora	....	....	....	....	....	....	....	....
Union Con	5¼	5¾	4.85	5¼	4.35	4.90	4.25	5.85
Utah	2.90	3.20	2.60	3.00	1.95	2 65	1.70	2.00
Ward	....	....	....	....	....	....	....	....
Wales	....	....	....	....	....	....	....	....
Yellow Jacket	3 05	3.25	3.15	3.35	3.10	3.30	3.05	3.25

Sales at San Francisco Stock Exchange

THURSD. Y A. M., Sept 27.		AFTERNOON SESSION.	
350 Alta	1.55@1.60	200 Andes	.50c
50 Alpha	.2.20	100 Alpha	.2.20
20 B. & Belcher	.3.15	330 Alta	1 50
300 Belmont	.1.50	700 Benton	.25c
100 Bullion	.80	20 B. & Belcher	.3.25
400 Bodie Con	.55c	200 Belmont	.1.40
440 Chollar	.2.70@2.75	50 Belcher	.1 05
50 Con. Virginia	.45c	110 Bodie Con	.55c
250 California	.15c	50 Chollar	.2.70
100 Crown Point	1.25	250 Con. Virginia	.45c
50 Confidence	1.70	50 Challenge	.35c
70 Eureka Con	.5.00@	80 Confidence	.1.60
300 Exchequer	.60c	150 Exchequer	.55c
170 Gould & Curry	.2.30@2 35	320 Gould & Curry	2 30
1000 Grand Prize	.20c	500 Grand Prize	.20c
1030 Hale & Nor	.3.70@3 80	1880 Hale & Nor	3.55@3 70
100 Justice	.50c	200 Justice	.55c
300 Mexican	.2.35@2.40	275 Mexican	.2.35
110 Ophir	.3.30	50 N. Belle Is	.45c
300 Potosi	.1.00@1.05	100 Ophir	.3.30
270 Savage	.1.70@1.75	50 Overman	.40c
520 Sierra Nevada	.3.80	100 Potosi	.1.05
450 Solid Silver	.25c	220 Savage	.1.70
50 Scopion	.60c	170 Sierra Nevada	.3.60@3.65
10 Utah	.1 85	130 Scorpion	.55c
630 Union	.4.45@4	850 Union Con	.4.30
50 Yellow Jacket	.3 20	100 Yellow Jacket	.3.15

THE iron furnace at Hotaling is having a splendid run this summer. They are making iron with much less fuel in proportion than formerly. They run off every eight hours, or three times a day, an average of about ten tons of pig to the run. Their developments under ground show an encouraging increase in the ore deposit.

Mining Share Market.

Some little activity has been shown in mining stocks this week, although there have been no high prices. In fact, there is little to make a "market" just now. While all has been sufficiently encouraging at the main points of interest in the principal mines, there has not been made any showing of ore that was of sufficient importance to lift the prices out of the old familiar rut.

On the Comstock, the fires have been started in the furnaces at the Imperial, and the shriek of the whistle was heard for the first time in nearly two years. Work will be resumed in the old upper levels immediately. This is quite a boom to Gold Hill, and all that is needed to make that town resume a fair share of its former activity is the resumption of work in the Yellow Jacket, Crown Point and Belcher.

At the Norcross they have commenced clambering out for a station on the 2700 level, and will shortly begin crossentting there.

The water in the Alta is down to the 1550 level. With this level there are connected a number of drifts, the draining of which will probably take two or three days. This is the last level before reaching the bottom of the shaft.

Bullion Shipments.

Contention, Sept. 21st, $14,604; Moulton, 20th, $9,337; Hanauer, 20th, $6,205; Ontario, 20th, $4,197; Horn Silver, 20th, $12,000; Horn Silver, 22d, $24,000; Ontaria, 22d, $8,465; Vienna, 22d, $4,300; Hanauer, 23d, $10,090; Crescent, 24th, $5,175; Ontario, 22d, $4,087; Horn Silver, 23d, $12,000; Alice, 23d, $14,884; Hanauer, 25th, $7,800; Stormont, 25th, $2,630; Horn Silver, 25th, $27,000; Vienna, 25th, $1,450. During the week ending September 22d, there were shipped from Salt Lake 42 cars of bullion, 1,047,409 pounds, sent East; 13 cars of ore, 285,400 pounds, sent East; 8 cars of ore, 129,180 pounds, sent West, and 1 car of white lead, 25,000 pounds, sent West; making a grand total of 64 cars, aggregating 1,486,589 pounds.

THE PRICE OF ALUMINUM.—The statement, widely circulated in the beginning of the year, which obtained credence in some quarters, that aluminum could by a new process be produced at from 90¢. to 100¢. per ton, seems to have been exaggerated. Dr. Wahl, secretary of the Franklin Institute, has reported upon the new method, and finds that it is utterly impossible to produce the metal at anything like the cost named. The only new portion of the method referred to is, he states, that which deals with the treatment of the raw material, which he considers impracticable. The sodium alone required to reduce 1 lb. of metal from the chloride is between 3 lbs. and 4 lbs., and costs nearly 4s., which alone brings the price of the extracted aluminum to about 450. per ton, to say nothing of the other tedious and costly processes employed.

THE State Bureau of Labor Statistics, John S. Enos, commissioner, and Hugh J. Mohan, deputy, has issued an elaborate blank directed to county assessors and other officers throughout the State, which, when properly filled, will furnish the basis of a very valuable report from that department. The circular contains the following: "The bureau is clothed with ample authority under the law to compel answers, but it much prefers to depend upon the good will of the people." There are also blanks directed to employers and employes, with requests that the same be filled out.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Alpine.

ISABELLE.—*Monitor-Argus*, Sept. 21: The output of bullion from the Isabelle Co., is begining to encourage the people. Last Tuesday two more bars were shipped, making in all seven bars since the mill was started up about the middle of last month. Considering the report of the recent find of a rich body of ore in the Stella, which is now being milled at the Exchequer mill, we may expect heavy shipments of bullion from this on.

Amador.

SUTTER CREEK.—*Ledger*, Sept. 22: The Mahoney mine matter, notwithstanding the sale of the property under foreclosure of liens, seems as far from settlement as ever. There is said to be about ten tons of sulphurets, worth $75 per ton, now being roasted at the sulphurets works. Sinking at the Amador Con. mine is finished, and cutting stations and getting ready for drifting is now in order.

NOTES.—The rock from the St. Louis claim, crushed at the Kennedy mill, cleaned up between $5 and $6 per ton, it is claimed, for the latter part of the run. The Seaton mine and mill was attached on Saturday by Brinn & Bro., for $1,600. The mine is idle at present. The miners have demands against the company for about $6,000. The Mammoth tunnel is at a standstill on account of water. The contractors worked eleven days, and put the tunnel in 45 feet. They will probably work by hand drill until a supply of water can be secured. The Zeile mill can only run from 20 to 25 stamps, on account of shortage of water.

A DRY TIME.—*Sentinel*, Sept. 19: For the first time in its history the Amador canal is short of water. The Blue Lakes, which have been depended upon to furnish a supply at this season of the year, are unable to respond, owing to the fact that little snow fell in the winter of 1882-83. But five stamps are running at the Zeile. The Supt. is trying to make arrangements to run by steam. The Keystone mine at Amador is already using steam. Matters are again at a standstill at the Jackson mine. It is reported that the crushing paid six or seven dollars per ton.

PLYMOUTH CO.—*Dispatch*, Sept. 15: The Plymouth Mining Co., owning the Pacific and Empire mines, headed by Alvinza Hayward, are making arrangements to construct an immense reservoir, six miles above Oleta. The reservoir will be supplied from the Cosumnes river, will cover two hundred acres, and will require a dam sixty feet high.

Calaveras.

EMPIRE.—*Chronicle*, Sept. 22: The Empire mine, in Old Woman's Gulch, is doing well of late. Since the Cook Bros. have undertaken the management it has been steadily in operation with satisfactory results.

DOC. HILL.—*Mountain Echo*, Sept. 19: The ore in the Doc. Hill mine, now being successfully worked by Findlay and Love, is of immense richness. The vein, at a depth of 50 ft, is 7 ft wide, about 3 ft of which has yielded from $150 to $200 per ton.

GOLD HILL.—In last week's issue, we mentioned that a rich strike had been made in the Gold Hill mine, since which we have learned from authority that 200 ounces of clean gold were taken out in 5 days' time week before last.

BLACK OAK.—This mine is opened by a tunnel 120 ft into the hill, where a shaft 60 ft deep is sunk, in the bottom of which is a well defined lead from 3 to 4 ft wide, the yield of which, by arastra, is from $25 to $30 per ton. The ore contains nearly 10 per cent of sulphurets, assays from which have been made, yielding $280 per ton.

Del Norte.

BALD HILL.—Crescent City *Record*, Sept. 15: The Del Norte Gold Quartz Mining Co., situated on the Bald Hills, seems to be progressing finely. We were shown some quartz taken from there this week, which was exceedingly rich in free gold. The ore was taken from the shaft.

El Dorado.

SPANISH DRY DIGGINGS.—Georgetown *Gazette*, Sept. 21: Rich quartz has recently been discovered near the river north of Spanish Dry Diggings. It is supposed to be an extension of the Sliger, and some of the rock shown us will go away up into the thousands. Mr. Bowers is one of the lucky owners.

DAVIDSON.—*Republican*, Sept. 20: This mine, under Mr. Gross, is proving a valuable property. He ran a crosscut west, about 50 ft from the original works, and struck a large body of fine ore from 3 to 4 ft in width. Mr. Burlingham, the Supt., keeps the mill running night and day, and claims the ore will not work less than $12 per ton.

BALTIC.—*Democrat*, Sept. 22: J. W. Ashton and the Campini Bros. have been prospecting their extension of the Baltic mine extensively. They have sunk to a depth of 80 ft, and at that depth tapped the ledge through a tunnel 200 ft long. The mine has yielded a fine prospect all the time, and they are now figuring on the erection of a Dyer Cannon Ball mill.

Inyo.

BISHOP CREEK.—*Independent*, Sept. 22: A correspondent sends the following: The Sacramento mine closed down eight weeks ago, because it would not pay. Van Eps, the Supt., gave four Mexicans the privilege of working the mine, and this is the result. Four men four weeks, fifteen tons of ore, one arastra, worked by one mule, and one of the four men to drive him; coin in hand, $977.50. The mine speaks for itself.

THE MODOC.—Following is the report of Supt. Fitzgerald: Amount of ores and selected slag at furnace, 259 tons. Iron ore, 32 tons. Wood, 40 cords. Coal, 5,200 bushels, to be hauled; 4,800 bushels coal to tons iron. Would have started furnace, but the teams broke down twice; last time three animals were killed on the grade. Amount of ore from New Discovery so far, 37 tons; assay of fine, 142 ounces; of the coarse, 213 ounces. Am increasing the force as I get room for them. Present output, 4 tons per day. The above assays are averages from every carload.

Mono.

MAY LUNDY.—Homer *Index*, Sept. 22: The only change to note in the May Lundy mine is the increase in the size of the ore vein in the bottom of the new winze from the lower tunnel. The north drift on the 156 level of winze 1 is still carrying a 4-foot vein of high-grade ore.

NOTES.—Work will be resumed in the main drift of the Jackson on Monday. Lake View is turning out rich ore from the west vein. The Gorilla Co. on Wednesday last settled its indebtedness and resumed operations in the mine and mill. Last Sunday Bill Erwin started up his arastra, below the lake, on ore from the Erie and Rose mines.

BODIE CON.—*Free Press*, Sept. 20: During the week ending the 15th, 138.29 tons of ore were sent to the mill, and 157.5 were crushed. The average assay value of the pulp was $27.97 per ton; that of the tailings was $5.47 per ton.

STANDARD CON.—During the past week there were extracted and shipped to the mills 1,389 tons of ore. The bullon shipment was valued at $20,263.69. The east crosscut, 1200 level, is in 540 ft, having been run during the week 20 ft.

Nevada.

CENTENNIAL DRIFT MINE.—*Transcript*, Sept. 21: Supt. Baker, of the Centennial drift mine, near Washington, is having big odds to contend with in putting down the shaft. When the new pumping works started Monday the shaft was 53 ft deep, and 30 ft of water in it. That was pumped out, and sinking has since been going on at the rate of 3 or 4 ft per 24 hours. The water pours in so fast that they have to raise 2 buckets of it to each 1 of dirt that comes up. It is believed by old miners that the great auriferous gravel channel will be reached at from 250 to 300 ft.

NOTES.—*Union*, Sept. 25: The Imperial is putting in a new pump. Work is going on at the Greely-Blackman mine. Good progress is made in new hoisting works on the Magenta Con. The Peabody, adjoining the Gold Hill on the north, has been bonded for two years, and operations are to be commenced this week.

MOUNTAINEER.—*Transcript*, Sept. 26: The Mountaineer is one of the growing mines of the district. About a year ago, when the company began to talk about sinking below the tunnel, they thought it would be necessary to go on the hill 400 ft higher, and putting up hoisting and pumping machinery there, pass down through the intervening space to get where they wanted to. Instead of all this they have gone into the tunnel about 800 ft and are sinking from there, using a water wheel for power, running the material out through the tunnel by cars. This saves much labor and time.

YUBA RIVER TUNNEL.—The Yuba River Tunnel Mining Co., at Hoyt's old crossing, commences this week to construct the big flume that is to divert the water from the river bed. About 300 ft of it will be completed this fall. The tunnel has to be widened near the shaft and the bottom of it lowered at the head.

Placer.

WHISKY DIGGINGS.—Grass Valley *Union*, Sept. 25: The California Copper mine, at Whisky Diggings, Placer county, is to have steam machinery, M. C. Taylor being now in San Francisco procuring the same. A shaft has been sunk 60 ft, in which ore of excellent quality is shown. The headquarters of this company is at Grass Valley, where all of the stock is owned.

San Benito.

GABILAN MOUNTAIN.—*Advance*, Sept. 21: Uncle Henry Watson has returned to Hollister from his hunt in the Gabilan mountains for the lost silver mine that was worked in an early day by the native Californians. Mr. Watson reports that he has not found the old mine but has made a find that will shake up San Benito county in the near future.

San Fernandino.

GARFIELD.—Calico *Print*, Sept. 22: A few days ago a very rich strike was made in the lower tunnel of the Garfield mine. The tunnel is in 190 ft. The body of ore is described as surpassing anything yet discovered in the mine.

MAMMOTH.—The lower tunnel is in 200 ft, at a depth of 250 ft from the top of the ledge. The upper tunnel is in 60 ft. A drift is being run in to connect the upper shaft with the lower one. From 10 to 15 tons of good ore are daily crushed at the Oriental mill.

GOBBLER.—On the side of the hill above the canyon blue ore 10 or 12 ft in width has been uncovered that astonishes all who have seen it. This mine is in the same belt as the Garfield, and undoubtedly will prove as rich.

GOLCONDA.—A vein is being opened that is yielding beautiful ore. We were given several pieces that will assay up in the thousands. It is the intention at this point to drift on the ledge.

Shasta.

BULLY CHOOP.—Anderson *Enterprise*, Sept. 22: J. A. Grant, of the Mammoth, is still crushing selected ore. Owing to the scarcity of water he cannot run over eight hours a day. The Cumberland tunnel is progressing slowly. The rock is so hard that very little is taken out without the aid of powder. The Bully Choop Co. are sinking their shaft as fast as three men can do it. They have been taking out excellent rock. The Davis Brothers, of the Pound Cake, are taking out a larger percentage of sulphurets than any other mine on the hill. The Little Gem is a new location by Whit George and the Haskins brothers. The Daisy, another new location by Geo. Weitemeyer and others, has made a very satisfactory showing.

Sierra.

SIERRA BUTTES.—*Tribune*, Sept. 30: The Sierra Buttes mountain has been penetrated by a perfect network of tunnels. From the time that the ledge was first located, in 1850, it has never failed to yield handsome dividends. The total yield of this mine cannot be accurately determined, but it is estimated that up to 1880 it had yielded no less than $7,000,000. In 1876 the Sierra Buttes Co. purchased the Independence, the western extension of the Buttes lead. The present owners struck a rich lead, and it is now yielding largely. The Sierra Buttes started No. 9 tunnel last year. This tunnel is on a level with Sierra City, and will eventually be run 9,000 ft. At 6,000 ft it is expected the pay ledge will be struck. The foundation for the 60-stamp mill at No. 9 tunnel is laid, and the framework has been started. The total receipts for July were $20,913; total working expenses, $12,825, and $2,311 spent on the ninth level, and $3,071 spent on the new mill. The Columbo mine, west of the Independence, is a continu-

ation of that and the Sierra Buttes lead. Through the efforts of J. P. Deidesheimer, this property was recently purchased by an Eastern Co. for $27,500. The mill, to contain 20 stamps, is being built about 800 ft below the tunnel. It is expected to have the mill in running order by the 10th of November.

RUBY.—*Messenger*, Sept. 22: On Saturday the Ruby Co.'s tunnel struck through into gravel 148 ft from the main tunnel. There is very little water yet, and the bedrock is pitching. About 100 ft further will be run before sinking. The rock has all been blasting, but is getting softer.

FOUR HILLS. The Four Hills mine made a fine shipment of bullion this week. The mill is not running now, owing to there not being sufficient water to supply the engine.

Trinity.

DEADWOOD.—*Journal*, Sept. 22. The latest strike is reported as having been made by Hyer, Dennison & Co., half a mile above Lambert's mill. With nothing but good looking float to commence on, these men started a tunnel and have been rewarded by striking a nice vein of quartz after running 84 ft. In the top of the tunnel the vein is only half an inch, but it widens to 6 inches at the bottom. The parties are confident that they have a big thing.

Tuolumne

SANTA MARIA *Democrat* Sept. 22: John H. Neale, on the Santa Maria mine, near Crocker's station, informed a representative of the *Democrat* that his mine is turning out handsomely. He has a Huntington, Centrifugal, which crushes 5 tons every 24 hours, and saves ninety per cent of the gold in the battery.

LOUIS PAGE, who is mining on the north fork of the Stanislaus, near Five Mile creek, made a handsome clean-up last week.

NEVADA.

Washoe District.

UNION CON.—*Enterprise*, Sept. 22: On the 3000 level the south drift is out about 115 ft from the main west crosscut. It is still cutting streaks of metal-bearing quartz of promising character. The joint Sierra Nevada winze below the 3000 level is down nearly 80 ft. An increased amount of mineral-bearing quartz is coming in at the bottom.

MEXICAN.—The upraise from the 2900 has yet nearly 20 ft to go to connect with the winze down from the 2700 level. The rock is very hard, and the miners are obliged to work under blinding showers of hot water, yet they have thus far managed to make about 8 ft per week.

OPHIR. Good headway is making in the west drifts on the 150 level. As soon as connection is made with the winze going down, a circulation of air will be obtained which will permit of exploring in all directions on the tunnel level, as well as to a considerable depth below that point.

SIERRA NEVADA. North lateral drift No. 1, on the 2900 level, is being extended at the rate of about 20 ft per week. The joint Union Con. winze below the 3000 level is down nearly 80 ft. It is passing through mineral-bearing quartz that has a dip to the east.

SAVAGE.—Preparations for crosscutting on the 2600 level at the south line are being made.

YELLOW JACKET.—All is now in excellent order for the mining of ore as soon as the mills on the Carson river can resume work.

UTAH.—The repairs to the gallows frame and the overhauling of the hoisting engines is completed and work has been resumed in the north drift on the 1350 level.

COMBINATION SHAFT.—The station below the 2600 level for the new hydraulic pump is being excavated rapid y and is now more than half finished.

IMPERIAL.—Good headway is being made in the overhauling of the machinery preparatory to the extraction of ore from the old upper levels commanded by the Imperial shaft.

HALE AND NORCROSS.—The winze below the 2600 level is almost down to the 2700 level, at which point crosscuts will be made east and west.

SCORPION.—Excellent progress is being made in the west crosscut on the 500 level.

CROWN POINT.—Little can now be done except in the way of work preparatory to the extraction of ore when the mill on the river starts up again.

ALTA.—The water has been pumped out to the 1450 level.

GOULD AND CURRY.—East crosscut No. 3 is now being advanced in vein material of favorable character.

CALIFORNIA.—Have finished cutting out the chamber for joint Con. Virginia winze No. 2.

CON. VIRGINIA.—The work of cutting out a chamber for joint California winze No. 2 is about completed.

BEST AND BELCHER.—The west drift is gradually draining out, and work may soon be resumed at that point.

UNION SHAFT. Are still engaged in easing the timbers of the 2300 station.

OVERMAN.—Are extracting some ore from the old upper levels.

BELCHER.—Are awaiting the starting up of the mills.

Belmont District

TWO G.—Eureka *Sentinel*, Sept. 23: There is a mine at Tybo, Nye county, which up to three years ago, when it was shut down, had yielded $6,000,000. We refer to the Two G mine, on which work was resumed, a month or two since by Trowbridge & Co. It has never been prospected lower than 400 ft. At this depth water was encountered and work was stopped. Since starting up the mill the present company have turned out an average of about $500 very fine bullion per day. The run of the last 35 days was over $17,000, with $2,000 or $3,000 of amalgam remaining over. The company, owing to their closer milling, can utilize a great mass of ore in the mine, as well as considerable on the dump, that the former company did not succeed in working at a profit. It looks now as though the Two G has a good prospect of producing another $6,000,000.

Candelaria District.

NORTHERN BELLE.—*True Fissure*, Sept. 22: The daily output of ore is about 33 tons. Both mills are running as usual, five stamps of mill No. 2 being engaged on ore from the Great Western mine, in Garfield district. The bullion shipments on September account amounted to $8,122.02 on the 17th instant.

MOUNT DIABLO. The stope above the west drift from the Callison winze is turning out ore of good grade. The east end of the stope is turning out some ore of very high grade from a rather narrow ledge. A shipment of bullion was made on the 13th inst., of $4,803.39, and another on the 17th of $7,733.40.

COLUMBUS CON.—The connection between the shaft and the old workings was made last Thursday, rendering that part of the mine much more comfortable.

Eureka District.

EUREKA CON.—*Sentinel*, Sept. 21. Supt. Read of the Eureka Con. thinks he has a dead shot on reducing the water in the Logan shaft hereafter at the rate of 10 ft per week, according to which calculation the shaft will be dry in five weeks from date, as the flood now stands 50 ft deep. It has taken both the pump and the bailing tank to keep it down until now, but yesterday the pump alone began to hold it level.

Paradise District.

PARADISE MINE.—The Reno *State Journal*, of Sept. 22, says: Yesterday morning Wells Fargo & Co.'s car contained a silver brick from this mine weighing 133 pounds, of the value of $2,580. David Harlan, who arrived in Reno yesterday from Paradise, says that all the mines are looking well, and that the outlook for the camp never was more encouraging.

Pinto District.

FAIRPLAY.—Eureka *Sentinel*, Sept. 20: The recent development in the Fairplay mine, Pinto district, is proving itself a bonanza. Something like 300 tons have been shipped in already to the Richmond works for reduction, none of which has assayed less than $178, while much of it has gone a great deal higher. The last sample lot sent in was 42 tons that went by pulp assay $250 to the ton. The entire 300 tons shipped in will doubtless average $200. Dick Berryman, who is a careful miner, and not disposed to overestimate, says there is from $75,000 to $100,000 worth of ore actually in sight. Three 8 horse teams are running daily between the mine and the reduction works. They each make a round trip, about 17 miles out and 17 miles back, in two days, each hauling 7 tons, the three freighting in a total of 21½ tons every other day. The mine is leased by Kilgore, Dick Berryman and James Oliver for 12 months. They will make a big thing out of it. In fact they have made their "pile" out of it already. There are only 7 men working in the mine, and yet this small force extract the ore, hoist and sack it, and load the three 8-horse teams with it. It should be said that the ore shipped in unassorted, but loaded into the wagons just as it is shoveled out of the ledge.

Safford District.

ZANOLI.—Eureka *Sentinel*, Sept. 19: Col. Tyson, Supt. of the Onondaga mine, Safford district, is at present in Eureka. The company have made up their minds to put up reduction works on the Humboldt. The Zanoli, Col. Tyson says, is looking fine. On the 50 level the ledge has been stripped 45 ft northwest and 45 ft, southeast on a body of high grade yellow carbonate ore. The same work has been done also on the 80 level on which the ledge, perfectly defined and with smooth walls, varies in width from one to seven ft. The mine has been prospected to the depth of 112 ft, the ore going all the way to the bottom. They propose to run a tunnel in to strike below the incline at a depth of 300 ft from the surface to drain the mine. They expect, as in the case of the Onondaga, to erect works of their own on the Humboldt.

ARIZONA.

UNITED VERDE CO.—*Miner*, Sept. 14: The United Verde Co. were recently offered for their property in Black Hills the round sum of $2,000,000, which they refused. The price may seem large, still when it is taken into consideration that several hundred ounces of silver come from each ton of the rock, in addition to the 40 % of copper, with a vein of ore 60 ft in width, it will be readily understood.

PINE SPRING.—Work progresses on the Pine Spring property and the ledge has widened. A depth of 95 ft has been attained, and five ft more is to be sunk, when drifting will commence. Good ore comes from the bottom of the shaft. Shaw & Co. are working an extension of the Pine Spring. Good ore is found and the vein is of good size. There is not a richer district in the Territory than Turkey creek, which is mineralized a distance of 40 miles in length by 20 in width. The Dosoris is on a line with the Pine Spring and is yielding fine ore. Col. Bigelow is shipping $450 ore from his mine. All over this section mining matters are looking up.

SHUT DOWN.—The Tiptop force has been discharged and for the present work suspended. An assessment has been levied.

OLD DOMINION.—Silver *Belt*, Sept. 15: Old Dominion shipments for the week, 767 bars copper—234,885 pounds. Furnace No. 2 was started on the 8th, but shut down the same day on account of scarcity of water. A new well has been dug, and the second furnace will be started to-day. Full supply of coke on hand, and teams arriving daily with more. Bullion 98½ fine.

ARIZONA CENTRAL.—The ore body is represented as about three ft wide and unparalleledly rich, some of it going as high as $18,000 per ton. Such are is not a representation of the ore body, the average, however, of the ore, it is claimed will go $500. The Fame which is near the Arizona Central is also reported as turning out rich ore.

MINERAL HILL.—Pinal *Drill*, Sept. 15: The Alice is under work steadily. They are working on the north croppings and are in fine ore. Assays show high results, and the owners are in excellent spirits. In the Monarch of the Sea they are in fine ore. They have struck richer ore in the Eureka. The Frankfort shaft is down 47 ft deep all in ore. The general sample of 20 pounds selected promiscuously on the dumps assayed $68.43 per ton.

SILVER MOUNTAIN.—*Courier*, Sept. 15. Copper Basin, where C. C. Bean's great mining field is located, is in the timber, 10 or 12 miles southeast of Prescott. Eminent miners have cast their eyes over the properties and pronounced them good. Copper ores exist all through the basin. Mr. Bean will soon have government patents to from 12 to 20 claims. New York parties are anxious to own them, but it is doubtful if he now cares to sell, since it is a proven fact that nowhere else in the world is there so large an area of rich copper ore. Smelters are now being constructed in Chicago to work the ores.

COLORADO.

ROCHESTER.—Pitkin *Independent*, Sept. 15. On Monday we visited the Rochester, the wonderful lode recently discovered on Fairview mountain, and can say that the reports are not exaggerated. The discovery shaft shows the vein 8½ ft wide. On the dump were 15 to 20 tons of fine looking truck, and there were 25 sacks filled with stuff that according to assays runs upwards of $300 per ton. This ore will be among the first to reach the new sampling works, and according to indications the Rochester can be made to yield an output daily from his time sufficient to more than pay expenses of working. The vein is now proved up for a distance of several hundred ft above and below the shaft, in one place showing between five and six ft of ore at grass roots.

BULLION CAMP.—*Mining Gazette*, Sept. 15: The mineral in the shaft of the Argosy lode, Bullion Camp, is increasing in quantity rapidly as depth is obtained. The pay streak is now 8 inches wide, a sample of which assayed 210 ounces silver, and 1¼ ounces gold per ton.

SEVEN-THIRTY. During August the shipments, largely from development work, aggregated 53½ tons of smelting ore, netting $126 to the ton, or about $6,700. At present the main shaft is 390 ft deep from the surface, with four levels below, and three above the crosscut tunnel. These levels are driven at intervals of 60 ft and together measure over 6,000 feet. Just below the tunnel a rich body of ore was stoped for 50 ft, returning $50,000. Adjoining this is a reserve of equal length and apparently the same value. In driving this level, 900 ft, mineral in paying quantities was encountered the whole length, proving the continousness of the vein. In the second level below the tunnel the most recent mill runs have made returns of over $700 per ton.

IDAHO.

SMOKY BULLION.—Wood River *Times*, Sept. 12: The last of the machinery for the concentrator for the Bullion Con. M. Co., in Little Smoky district, was loaded on ox teams to-day, at the railroad depot. Among other things is a tubular boiler 12 ft long, 56 inches in diameter, weighing a little over 10,000 pounds. The entire plant of machinery weighs over 50 tons, there being two sets of rollers, the longest pair 2½ ft in diameter and 16-inch face, and all else in proportion. * * * One of the miners came in from there last night, and reports a grand strike in the north drift from the bottom of the 100-foot shaft on the Bullion mine, and fine ore coming out of the other shafts on the same mine. Tunnels are being run for the vein on both the Providence and Ophir mines, but they are not in far enough to cut the ledge.

RED ELEPHANT.—Mr. Richardson, owner of the Red Elephant group of mines, was in town a day or two ago to look after some ore which he had just shipped to the sampling works. There were 12 tons in the lot, which assayed 100 ounces silver and 60 per cent lead. This was only a sample lot, as Mr. Richardson is not prepared to extract ore in large quantities. Mr. Richardson is confident that the Red Elephant group will yet prove to be the richest mines in the vicinity of Bullion.

SAWTOOTH.—Ketchum *Keystone*, Sept. 12: The dormant state into which this camp has been plunged for the past year was aroused this noon by the shrill whistle and falling stamps of the Columbia & Beaver mill. Messrs. Vernum and Stephens, of the C. & B. Mill and mines, have had a great deal to contend against, having the protested paper of the former management to pay off, and to face the prejudice of mine owners, who regard the new process of leaching as an innovation not to be trusted. The run this fall, owing to the lateness of the season, will in all probability cease about Dec. 1st.

PRIDE OF IDAHO.—Ketchum *Keystone*. Sept. 15: Mr. J. W. Davidson recently had 50 sacks of ore from this mine reduced at the Philadelphia smelters, which gave the following: Silver, 170 ounces per ton, and 50.80 per cent lead; value per ton, $217.81. The number of pounds sold was 6,023, for which Mr. Davidson received $428.98. The Pride of Idaho is a good-sized vein. Its location is on East fork of Wood river.

NETTIE MOORE.—According to the latest report, the miners employed in tunneling to crosscut the ledge, ran into a fine, large body of ore 60 ft under the surface, and in the breast of a 100-ft drift. The ore is high grade galena. This property is on Warm Spring creek.

ATLANTA.—Ketchum *Keystone*, Sept. 8: Atlanta is now enjoying the long since expected boom. At present 200 or more men are working. Two mills (the Last Chance and the Buffalo) are pounding away, and as soon as the Tahoma and Leonora are completed, they will both start up. The Leonora is all under cover, and ready to plant the machinery. The Tahoma is nearly as far advanced. The Monarch is extracting ores of high value. The Last Chance is under full blast, and is still putting on men. The wood and logging contract taken by Althouse & Abbott for the L. C. Co., is fast nearing completion. They, no doubt will continue their work all winter. The Buffalo Co. will resume work in a few days. The Atlanta mine is working a small force and is looking better than ever. Fred Gaetz has struck it rich up Montezuma gulch.

VIENNA. The Vienna mill continues to run with success. The 25th bar was turned out on the 5th inst. These bars weigh from 100 to 120 pounds each, and assay at least 95 per cent.

MONTANA.

PHILIPSBURG.—Butte *Miner*, Sept. 12: A fine shipment of bullion from the Granite Mountain and Hope mines passed through the office of the Express Co. in this city yesterday. Twenty-nine bars over 900 fine, and valued at $66,800, were from the Granite Mountain, and were the result of a 14 days' run of the 20-stamp mill, the average mill return for the run being about 200 ounces. Eleven bars, valued at $10,200, being the output of a 30 days' run of the 10 stamp wet crusher mill, were from the Hope mine.

TIDAL WAVE.—This district is in Madison county, in what is known as the Tobacco Root range. In 1864 work was done by prospectors who were looking for gold. In 1881, working facilities being better, the camp was again propected for silver, and with good success. At present there are a hundred paying prospects, and new leads are being struck every day. Assays may be had from some of them as high as $6,000. The veins are well defined, and for what development has been done, no camp in Montana has a better showing.

BOWLDER VALLEY.—Cor. Helena *Independent*, Sept. 6: Mr. E. Nottingham has sunk a new shaft on his Stockton lode and at 23 ft has struck a body of ore 6 ft wide, with only one wall exposed as yet. The ore consists of galena one ft thick, a sample of which assayed 86 ounces in silver and $35 in gold to the ton, the other 5 ft consisting of good concentrating ore. This lode is opened by four shafts, developing the vein for a length of 200 ft. Mr. Nottingham is driving a tunnel which will tap the vein 125 ft below the surface. The tunnel is 60 ft in, with 90 ft more to run. The "Bobtail," belonging to Nave & Co. is developed by a shaft 70 ft and another 25 ft deep; the pay streak is two ft wide, and produced very fine carbonates of lead on the surface; at the bottom the ore is mostly galena. Several lots have yielded from 50 to 300 ounces in silver to the ton. The Josephine owned by the same parties, shows the same ore. The shaft is 25 ft deep, and at the bottom the vein proves to be 7 ft wide. Currin and Cooke are in luck. While running an open cut on their Alice claim, they unearthed five tons of float, two tons of which, looking better than the balance, were sent to Hill for assay; Mr. Hill returned 199 ounces of silver to the ton. As the cut was only 21 ft long by 3 ft wide, and the claim is covered with the same looking float, the owners estimate that they have 38,000 tons of ore above ground. The Equitable Co., W. M. Mumbrue, superintendent, are representing prospects in this district. Their main force is concentrated on the Willie, on Hyora creek. Mr. Mumbrue showed us assays, among others one of 3000 ounces to the ton.

GLOSTER.—The work at the Gloster mine is progressing rapidly. They have the pan sills in for the new pan mill, the grading is all completed, and the foundation walls of the enormous building (200 by 60 ft and 80 ft high) are all laid. The excavations for the foundation for the 300 horse-power engine are being made. The entire 60-stamp mill with 24 pans and 12 settlers, crushing 180 tons of ore per 24 hours, will be running by the 1st of November.

NEW MEXICO.

LAKE VALLEY. Kingston *Tribune*, Sept. 13: Dr. Endlich returned from Pueblo Tuesday. The tailings shipped, amounting to 9,800 tons, netting the company, clear of all expenses, nearly a quarter of a million dollars. A satisfactory contract has been made with the Pueblo smelter for shipments hereafter. Eight carloads of good ore have been shipped during the past week. The diamond drill has arrived and will be sinking a hole in the Grande near the Roberts shaft. The workings are all looking well. The force of miners has been increased to two hundred and twenty-five in the past ten days. A 25 cent dividend, or $100,000, has been declared on Sierra Grande, and on the same day Dr. Endlich telegraphed the company $50,000 more. The ore shipments have been made of sufficient amount to pay off the entire debt of the Sierra Bella.

MONASKA.—Kingston *Tribune*, Sept. 6: In Nos. 1, 2 and 3 levels, large bodies of ore have been struck within the last ten days, the richness of which surpasses anything yet found in Grant county. The pay streak is twenty-eight inches in width, a portion of which, from eight to ten inches in width, is sacked in the mine and shipped without sorting. Nearly all of the ore requires but little sorting, its character being chlorides, sulphides and bromides of silver. About 60,000 pounds of ore was shipped last month, and there is now sacked and ready for shipment one carload. A piece of pure sulphide of silver was recently found near the contact, showing that there is another deposit that has never been tapped by any of the present workings.

MAYFLOWER.—Correspondent of *Southwest Sentinel*, Sept. 8: Work is being prosecuted as fast as time and money will permit, the main work being put on the Chalchihuites shaft, there being a shaft down fifteen feet with hard quartz, carrying bromide and sulphide, with silver, copper glance and chlorides. The lead is capped with fine birds-eye porphyry, carrying a great amount of iron. In the present hanging wall there is as fine lime carbonate as a man would wish to see. There are 125 tons of good ore on the dump that would pay well if we had a smelter here. I will give you an idea of the magnitude of the most prominent mines. The Chalchihuites mine is twenty-five feet wide at fifteen feet deep and no foot wall. The Gazelle is twenty-five feet solid ledge. The Lucky Mack is thirty feet, at least. The Cyclops is thirty feet, and the Blue Carbonates mine is about twelve feet. On all of these claims $300 mineral can be knocked off the entire length.

SAN JOSE CREEK.—A five-stamp gold mill is to go up in connection with the Mayflower and Clyde mines. The owner of the mines is Wm. Walker, of Silver City. Recently he made arrangements with St. Louis capitalists, giving them a one-half interest in his mines, in consideration of their putting in the mill, giving him a half interest in the same, and furnishing means to develop the mines.

CAMP FLEMING.—*Southwest Sentinel*, Sept. 12: The Penrose Bonanza, at Camp Fleming, is coming to the front. Last Saturday a four-foot vein of rich horn silver was uncovered, which promises to develop into a true fissure.

BEAR MOUNTAIN.—*Southwest Sentinel*, Sept. 15: A rich find in the vicinity of Bear mountain is creating no little excitement. Float, containing large quantities of horn silver, is liberally scattered over the surface, and preparations are being made to go down to find the lead.

UTAH.

SILVER MOUNTAIN.—Salt Lake *Tribune*, Sept. 15: The Silver Mountain mine, Big Cottonwood, is attracting considerable attention. During the past week there has been a decided improvement in the appearance of the mine, and they are now shipping ore regularly. To ship ore and get supplies to the mine, it became necessary to construct a road up the side of the mountain, and this has been done under contract. The road was completed and turned over to the company about September 8th. This ore is hauled to Sandy, 20 miles, at $20 per ton. As it is worth $100 per ton, there is a large margin left for the company. The ore assays 75 ounces silver, $15 in gold and 45 per cent lead.

Grass Valley and its Mines.

(CONTINUED FROM PAGE 194.)

its comparatively noiseless operation when at work crushing ore; conversation in an ordinary tone of voice is not interrupted; no thunder of dropping stamps drown the voice or pains the ear; workmen who attend the machine are in no danger of partial or permanent deafness, as has often resulted to men employed in stamp mills. As a sanitary feature, this point deserves consideration, and ought to recommend it, and this should be "a desideratum" to any contemplating the erection of reduction mills. The above mill was illustrated by an engraving and description published not long since in the MINING AND SCIENTIFIC PRESS, and, I believe, is now advertised by the manufacturers in that paper. Mr. C. H. Hawkins, of Grass Valley, has the sole right of manufacture and sale in the counties of Sierra and Nevada of the Dyer mill. Parties desirous of information, resident in these counties, should make it their business and find it to their profit to call at Mr. Hawkin's mill, at Grass Valley, inspect the machine, and observe it working. This will best enable them to judge of its utility and value as a practical quartz crusher. F. A. WILDER.

Grass Valley, Nevada Co., Sept. 22d.

In The Redwoods.

The San Lorenzo river is the principal stream of Santa Cruz county, so that it is dignified by the name of "river" instead of "creek," though it is not navigable. It rises in the mountain near the summit, only six or eight miles from Congress Springs, Santa Clara county. The head waters, however, are over the ridge on the Santa Cruz side of the mountains. It is here a fine clear stream, flowing steeply until down about Buckskin Lawrence's, where the stream begins to run more level and get larger. From there down it receives constant additions of water from numerous tributaries. First comes King's Creek, flowing down from the summit and about doubling the quantity of water. Several smaller streams come in before the main stream reaches the Bowlder Creek, some seven miles above Felton. At this point Bear Creek joins the Lorenzo, Bear having previously been amplified by its own tributary, Deer Creek. Right opposite enters the Bowlder Creek, a good large stream. Further down the Cyante comes in, as well as several smaller streams. Near Felton it widens and becomes deeper, and so continues to Santa Cruz itself, through where the San Lorenzo flows. Not only the main stream but its tributaries also contain an abundance of trout, and for those who love angling there are no finer places. The scenery along the Lorenzo is very fine. The mountain ridges and canyons are covered with timber. The climate is warm and mild, and in the summer is far preferable to the interior of the State, where it is apt to be too warm.

Above Felton the prettiest scenery is met with. At Bowlder Creek, particularly, there is much in the surroundings that is enjoyable. There are numerous lumber mills at various points, and a large V flume conveys lumber from a long distance up the San Lorenzo down to Felton. The redwood forests of the region are very valuable, and there are immense tracts still available. As is mentioned in another column, the redwood of this State is now highly appreciated abroad and in the East as an ornamental wood, and the California redwood industry is attracting much foreign capital.

During the past few summers, that part of the Santa Cruz Mountains through which the San Lorenzo passes has been greatly sought after by campers. Being comparatively near to San Francisco, it is readily accessible by teams, and it is an abundantly watered region. The narrow-gauge railroad strikes the San Lorenzo at Felton, and hundreds of people camp thereabouts every year.

The water of this creek is very pure and clear. There are many very picturesque spots along its course, which to a lover of nature are highly enjoyable. As the creek enters the Pacific ocean at the bathing beach, Santa Cruz, it broadens and deepens, and row boats may be used there. At this point, too, are numerous bath houses, and many prefer to bathe in the smooth waters of the creek, or "river," rather than in the rollers of the ocean.

Education and Industry.

The annual address at the State Fair was by Irving M. Scott, of this city, a thoroughly practical industrialist, demonstrating by his success in mechanic arts his right to speak about the principles which underlie the general attainment of such success. His address was a fervent and eloquent appeal for the recognition of the value of education in the industries, and his words will be hailed with delight by all those who believe that, to secure better deeds, you must improve the men. It gives us pleasure to present to our readers some of his stirring utterances:

The world has designated medicine, law and divinity as the learned professions, but it is fast finding out that it requires full as much talent and severe study to acquire a proficiency in the art and science of farming as to acquire a knowledge of the distinguished professions.

Modern science, based upon actual experiment, speaks whereof it knows. The science of agriculture consists of useful knowledge derived by experiment and by practice on a large scale. By means of it will depend the development of the resources of California to their fullest extent—to perfection.

Quoting Liebig: "Perfect agriculture is the true foundation of all trade and industry—is the foundation of the riches of States."

It is the highest duty of the individual and of the State to gather, foster and propagate this science, capable of conferring blessings so great and multifarious. How is it to be done?

Bacon, on proficiency and advancement of learning, says: "As water, whether it be the dew of heaven or the springs of the earth, doth scatter and lose itself in the ground, except it be collected in some receptacle where it may by union comfort and sustain itself, and for that cause the industry of man hath made and framed spring-heads, conduits, cisterns and pools, which men have been accustomed likewise to beautify and adorn with accomplishments of magnificence of state, as well as of use and necessity, so this most excellent liquid of knowledge, whether it descends from divine inspiration or springs from human sense, would soon perish and vanish to oblivion, if it were not preserved in books, traditions, conferences and places appointed, as universities, colleges and schools, for the receipt and comforting of the same."

California, appreciating the transcendent value of this most "excellent liquid of knowledge," founded, by the aid of the Act of Congress of 1862, the University of California, of which the College of Agriculture, by the expressed provisions of said act, was to constitute the most important feature. This University is situated in one of the most healthy localities in the State, with ample grounds, tastefully laid out and skillfully cared for; its buildings are substantial and adapted to the purpose for which they were designed; its scientific apparatus is in keeping with the most advanced state of learning; its collection of specimens in the various departments of science are choice and extensive; its officers, professors and tutors compare favorably with those of other Universities. And to this summary is to be appended, tuition free! The doors of this university stand wide open, inviting the sons and daughters of California to enter and partake of its bounteous blessings. The learned professors and their associates are in readiness to cordially greet them, and to lead them by pleasant paths into the rich and beautiful fields of science and art, and to assist them in gathering freely therein the abundant gems of knowledge which increase with usefulness and brilliancy the more they are worn.

In consideration of these advantages and the ability of our farmers generally to give their sons and daughters a collegiate education, it is a matter of surprise that so few avail themselves of the proffered boon; and especially is it a matter of surprise that of the scanty number of students from the farm so small a number study agriculture as a profession, for it certainly offers inducements to the aspiring youth not surpassed by any other occupation in life. Besides, "man is but what he knoweth." It is a fact established in modern science that force as a quantity, is constant, but is subject to change of form. Now he who changes in a fair proportion the form of force existing in wheat, grapes, pumpkins and other products of the soil, in cattle, horses, sheep and goats, into the form of brain force or useful knowledge, is a benefactor not only to his offspring and himself, but also to the public.

The progress of the age demands these changes of force forms; demands earnest scientific work in all the departments of industry, especially in that of agricultural chemistry. The machinery of agriculture has attained a high degree of perfection, and it is a great error that agricultural chemistry should be confined within such narrow limits and be so little applied in practice. The impression is too common among most classes that a collegiate education, instead of fitting one better to perform the duties of life, fills him with self-conceit, chimeras and impracticable notions. This fault, if existing at all, is not in collegiate education, but is inherent in the individual who, inflated with the idea that he is a genius, mistakes the glitter of polished brass for the more subdued lustre of pure gold. Or, who like Ixion, lacking a proper appreciation of his own abilities, allows his presumption and indiscretion to mistake a cloud for Juno! When he shall have completed a few turns upon the fiery wheel, he will be a wiser and a better man, and a more useful member of the community than he would be without education. It is by education that we more fully appreciate how little we know and how much there is to be known. The "Prince of Philosophers," when 84 years of age, remarked: "I do not know what I may appear to the world, but to myself I seem to have been only like a boy playing on the seashore, and diverting myself in now and then finding a smoother pebble or prettier shell than ordinary, while the great ocean of truth lay all undiscovered before me."

Education not only inspires modesty in the mind of its possessor, but sharpens, strengthens and disciplines the mental faculties for concert of action under the direction of the will; also matures the judgment, so that it is better enabled to counsel the will aright.

Education ennobles the mind, and impresses upon it that all honest occupations are honorable; that in labor, however humble, is enthroned true dignity. Michael Angelo said: "Every block of stone contained an imprisoned angel awaiting some one to set it at liberty."

The educated man, fortified by consciousness of right, rises above all petty conceptions of what might seem menial labor. What matters it if he gathers rags on the streets? So long as it is honest labor it is honorable. The gold for which he sells his rags is as pure and valuable as the gold which buys the rarest gem that adorns a diadem—perchance, the rags are of greater intrinsic value than the gem, for by labor they reappear in the form of paper, to whose fidelity is intrusted most of the business relations of life, billions of wealth, the treasures of art and of science, the records of events, the expressions of our innermost thoughts, and the inspirations of divine wisdom and of goodness. As the sturdy oak is developed from the acorn, the lofty pine and mammoth sequoia from diminutive seed, so the various useful industries, however huge their present proportions, have been developed from small beginnings. Others of like character will spring up, flourish, and, perchance, exceed in magnificence any now in operation.

The educated have an immense advantage over the uneducated in comprehending an industry in its length and breadth, in its minutiæ and entirety, and are more likely to attain success. But education alone is insufficient to secure satisfactory results in any undertaking; there must be native talent at the foundation. A good watch spring cannot be made out of lead, however much it may be hammered, rolled and polished; neither can an efficient workman in any profession be made out of dull inelastic material. The achievements of success are attained, for the most part, by those who understand the relation of things, and hence seldom err in their deductions from any given state of facts. In isolated cases blind fortune may make millionaires of beggars, or beggars of millionaires, but in general man is the arbiter of his own fate. Possessing fair abilities, he, by observation and close study of science and art, is enabled to utilize the forces and materials of nature so as to secure maximum results and minimum cost. Then, and not till then, is he truly practical. A term, too often sadly abused by being employed for purposes akin to that of Æsop's lion's skin—but the fiat of nature has gone forth—"The fittest survive." Lion's skins will not avail their wearers in these days of enlightenment. Different vocations require different orders of talent and culture, and as the kind and fineness of a metal contained in a mineral mass are most readily determined by crucial or cupel test, so the kind and quality of talent of our sons and daughters are best demonstrated by systematic study; according to the kind, quality and quantity of the talent metal they shall yield, will they be estimated in the treasures of the world.

The talent of the child is not due to his birthplace nor the profession of his parents. The farmer's son by talent may be best adapted to the practice of law, or of medicine, or of divini-



SCENE ON SAN LORENZO RIVER, SANTA CRUZ CO., CAL.

ty or of mechanics, or the son of the mechanic, lawyer, divine or doctor may be best fitted by nature to pursue some other profession than that of his parents. Let every legitimate means be exhausted to ascertain the character of the talent with which he is endowed; then cultivate it faithfully. Let not ambition or false pride thwart the plan of nature or will of heaven; for "vaulting ambition which overleaps itself, falls on the other." If he develop a talent and taste to be a blacksmith, wood-worker, or useful mechanic of any sort, or a farmer, let him be blacksmith, wheelwright or farmer, and bid him Godspeed. For they are all the noble sons of honest labor, largely the bone and sinew, nerve, life blood, mind and soul of all that is most useful, beautiful, grand glorious on earth. By their efforts we subsist, the granaries of the world are filled, cottages, palaces, temples of learning and worship, vast cities, are all the work of their hands; the necessaries and luxuries of life are the fruits of their toil, the vast navies and merchantmen are the works of their design and skill. Ye mothers and fathers, throw false ambition and false pride to the shades. Give to your sons and daughters trades and professions fitted to their talent and capacities, and marshal them as live energetic workers in the grand army of progress.

Southern California Silver.

The wheat crop of Southern California gives a pretty good account of itself, but the silver crop of 1883 will vastly exceed the wheat crop. It will be at least double the value the wheat and barley crop combined. During the month of August last there were shipped to China from San Francisco $5,750,000 in silver and but $38,000 in gold. So it seems that we pay our bills of tea and silk, rice and fireworks in silver, and not in gold; while on the other side of the continent during the past seven months we have sent specie abroad to pay our debts for sugar, molasses, fruit, spices, dyewoods, coffee, silks, dry goods, $269,529 in silver. This shows that our silver crop is in demand on both sides of the continent, and is a good thing to send abroad to pay our debts without impoverishing our soil, while the wheat that we send out of the country takes away very important and valuable elements from our farms, and like filching a good name, leaves the possessor poor indeed. The readers of the *Herald* should know that mining pays better in this part of the State than elsewhere according to the outlay; in other words, we are making more money on the capital invested than is made in any Territory of the Union. In mining matters distance lends enchantment to the view. We read of great mining operations in Utah, Colorado, Idaho and Montana, and they seem so large that our modest operators appear small and unimportant. It is the province of the *Herald* to correct these false notions, and show the plain facts. Take the great Homestake mine, owned by J. B. and Louis T. Haggin, in Dakota. It turns out $100,000 monthly—sometimes more, sometimes less. That looks large. But it takes two great mills, one of 80 stamps and one of 120 stamps, to turn out this amount, while there are little 10-stamp mills owned in Los Angeles that turn out $60,000 a month. While a few men in this vicinity get $60,000 a month from ore that yields $100 per ton with a little 10-stamp mill, it requires hundreds of men to furnish ore for 200 stamps in Idaho, on ore that has only averaged $6.85 for the past two years. These facts should be considered by capitalists in making investments. It is not the great mills, with great nominal capital, and a great way off, that pay the dividends, but the quiet, well managed mines that make no flourish of trumpet, but persist in turning out the bullion. There is not the shadow of a doubt but that the people of Southern California, in all their industries—of agriculture, viniculture, fruit culture, and mining—are making a larger profit on their investment than is made in any other part of the country.—*Los Angeles Herald.*

THE aggregate production of coal in Belgium in the first half of this year is officially returned at 9,006,643 tons. Of this production 6,657,896 tons were raised in the Mons district, and 2,348,547 tons in the Liege district. The number of collieries in activity in the Mons district was 82, and in the Liege basin 69, making an aggregate of 151. The production of pig iron in Belgium in the first half of this year is officially returned at 368,502 tons, viz: casting pig, 33,219 tons; refining pig, 270,853 tons, and pig for steel, 64,431 tons. The production of iron in the same period is returned at 228,761 tons, viz: rails and plates, 59,434 tons, and other descriptions, 169,327 tons. The production of steel was 177,707 tons, of which 95,786 tons were cast steel, ingots, etc., and the balance rails, plates, etc.

IT is stated that the commission of the Vienna Electrical Exhibition is preparing iron cases or screens for the protection of those whose duty will carry them into the vicinity of powerful dynamo machines. The very serious mischief that was done to many valuable watches in the early days of electric lightning led to the production of a machine by which the watch was steadily turned in front of a magnetic pole until it was again demagnetized, but it will, no doubt, be more satisfactory to the owners of good watches to avoid the necessity of such experiments.

USEFUL INFORMATION.

Preparing Lumber for Market.

A correspondent of the *Southern Lumberman*, who evidently understands his business, has the following to say to saw mill men who cut lumber for the Eastern market:

We know that trade is dull. We are told of it often enough, goodness knows; but for all that, even if the market is dull, good stock, properly prepared, will always bring a good price. Our saw mill men, and dealers, too, are too much in the habit of shipping poor stock to the Eastern market, and, if they have nearly a car-load of passably fair lumber, they will fill up by putting in a few hundred feet of stuff containing loose knots, or heart on one side, and various other defects, thinking that, as the greater part of the car is good, that the poor will be accepted. Mistaken idea; it will be thrown out, and if they receive any pay for it at all, the amount will be less than the cost of transportation, and thus they lessen the profits on their really fair lumber.

There is no use talking; this matter of properly preparing lumber for the market is an all-important one, and there should be a thorough canvas of the matter between the mill men and the manufacturers. It will result in much good to both.

Let me again say to the mill men: If you expect to realize a good price for your ash and walnut lumber, do not fail to see that it is properly manufactured before it leaves the mill. It must have square edges; sap taken off; leave no boards with hearts in them; trim the ends off square, and to even lengths, and see that it is not split by careless handling; and bear in mind also that thick lumber, one and a half inches and over, must be more nearly clear than thinner boards, if they pass into the grades of firsts and seconds. If you are cutting ash 4 inches thick—do not imagine for a moment that a board with heart showing on one side will pass as merchantable lumber. It will not. Put such boards back on your headblocks and saw them into thinner ones. The writer of this, who handles perhaps as much or more than any other dealer in the country, would gladly be willing to pay a better price, if lumber was brought to him in proper shape.

CARELESS HANDLING OF MACHINERY.—The ignorance displayed by many persons in charge of machinery is amazing. A gentleman who has spent the greater portion of his years in operating, selling and setting up wood-working machinery, ventures the remark that the majority of machine operators are incompetent to fill their positions. To substantiate this he relates numerous incidents coming under his notice, in which either lamentable ignorance or gross carelessness is displayed, and which seem to corroborate his statement. This gentleman finds that in far the greater number of instances, machinery does not work well because it is not kept in good working order. It may be carefully set up in the first place, but a few months' wear, unless under the care of a competent attendant, tends to bring about a very different state of affairs. Machinery that is run at such high speeds as most wood-cutting tools, will not remain in good shape very long if it is not closely watched. A good attendant will not only know when a machine is doing poor work, but will also know why it does so, and will at once proceed to correct the fault.—*Woodworker.*

MUD DRUMS.—The use of mud drums is very general in parts of the country where mud and sediment contaminate the feed-water, the purpose of the mud drum being to afford a separate vessel fartherest removed from that part of the boiler in which the most violent ebullition occurs, into which mud and sediment will subside where it does the least damage, and from which it can easily be removed or blown out. But in nine tenths of the cases of boilers so arranged that have come under the writer's attention, the feed-pipe is connected to the mud drum, and feeds through it to the boiler, which, of course, must keep its contents in a state of agitation, thoroughly mixing up the mud and settlings, assuming that mud or sediment does subside within it during the time when there is no feed on. If so, when agitated by the feed it must be forced into the boiler again, thus defeating the very object of its use.—*Woodworker.*

A NEW BISULPHIDE ENGINE.—What is represented as a successful attempt to utilize the bisulphide of carbon to drive a steam engine is described in the Lowell (Mass.) *Daily Courier*, of August 13th. With the engine and heater in use, the improver, Mr. W. S. Colwell, gets an expansive force of fifty-one pounds per square inch at the heat of 212 degrees, which, in the steam engine, with vapor of water, is *nil*. The claim is made for this motor that the objections heretofore urged against the use of bisulphide of carbon are all removed by Mr. Colwell's methods, which have been carried beyond the experimental stage.

VENEERS.—At this writing, the very latest veneer is called "marble" veneer. It is the invention of a German mechanic. An Eastern journal says it is fire and water-proof, and will not break, crack, peel or shrink. It can be made to imitate any kind of wood, and is especially adapted for wainscoting and like purposes. It can be applied to metal, stone, plaster, wood and cement. Like other new veneers, eminent architects have passed favorably upon it, and it is meeting with "encouraging success."

BELTS.—New forms of belts are constantly appearing. Hair belts are in use in Germany, but their cheapness over leather belts is doubted. A new method of manufacture, applicable to rubber, woven tissues, or gutta percha, consists in making the belt with longitudinal ribs or grooves, to increase its strength and prevent stretching and variations. Still another is to groove one side of the belt the same as saw teeth, then to put these two pieces together, thus obviating warping.

YELLOW OR WHITE PINE.—Although yellow pine is a very handsome wood, and likely to become very popular for certain purposes in the not far distant future, prominent lumbermen incline to the belief, that while the white pine lasts it will rank its yellow competitor in public estimation. Yellow pine is at present entering into many channels of wood-working, and when northern energy is once firmly settled in the southern forests, we may expect to hear considerably more of it than we do now.

THE imports of iron minerals into France in the first seven months of this year amounted to 956,827 tons, as compared with 836,916 tons in the corresponding period of 1882, and 734,404 tons in the corresponding period of 1881. The exports of iron minerals from France in the first seven months of this year were 59,666 tons, as compared with 64,973 tons in the corresponding period of 1882, and 45,400 tons in the corresponding period of 1881.

THE POPULATION OF CHINA.—The Rev. A. P. Happer, D. D., figures out a steady decrease in the population of China. He says the present number of inhabitants cannot exceed 300,000,000. Chief among the causes of the diminution is opium. He believes that the population of India will soon exceed that of China, the latter ceasing to be the most populous country on the globe.

EVIDENTLY inventors think we stand in need of a substitute for the time-honored cast iron pulley. We now have the wrought iron pulley with cast hub and spokes, the wood pulley with cast hub, the paper pulley with cast hub, the wood rim pulley with cast spokes and hub, and several yet to hear from. It looks as if either the inventors of these had made a mistake, or the cast iron pulley must go.—*Woodworker.*

EXPLOSIONS.—It is remarkable, but nevertheless true, that statistics show that over one-fourth of the boiler explosions in this country occur in sawmills, planing mills, and other wood-working industries. Does this large percentage arise from overwork of the boilers, or the incompetency of the men in charge?

GOOD HEALTH.

Diet for Scurvy.

Major General John P. Hawkins, of the U. S. Army, writes to the *American Grocer*, of New York, as follows:

In a recent number of the *Grocer*, that of March 22d, is the following: "It has recently been demonstrated that the apricot posseses more valuable anti-scorbutic properties than any other known fruit or vegetable. The British Government, on that very account, buy dried apricots very extensively." This statement attracts my attention, because it is the affirmation of a new knowledge or experience in the treatment of scorbutus, and further, it is the announcement of the discovery of a thing as true to-day, which the army and navy experiences of long ago and up to a recent period have demonstrated to be false; that is, the theory that any dried fruit or dried vegetable would prevent scurvy, or would cure it after it had been contracted.

The real cause of scurvy, the exact character of malnutrition that produces it is not absolutely known, but this much is certain, that when a person is entirely deprived of food in its fresh state, the tendency to scurvy may naturally be expected, and a scorbutic condition is generally the result, and, this condition is relieved or entirely cured only by the use of foods containing their natural, original juices, unchanged by desiccating processes, or not materially altered by long keeping, and this is the fact, whether the food be a meat or a vegetable. In the case of meat, its greatest efficiency as an anti-scorbutic is when fresh killed, and if the stomach can stand it, best when eaten raw; or if cooked, the process of cooking should go no further than to make it palatable. On the other hand, if the meat has been hung up for some time, if it has been kept long enough to become dried or approximately so, affording opportunity for its natural juices to have changed in some of their elemental characters, it will have largely lost its anti-scorbutic properties.

In the same way the fresh vegetable is best when fresh from the field and uncooked, if it can be so eaten. It is then in its best condition as an anti-scorbutic, and deteriorates or departs from that condition the longer it is kept, for its natural juices are changing day by day during its period of keeping, until finally, in a state of acknowledged decomposition, it loses all the virtues it originally possessed, and is pronounced to be no longer fit for food. The experience of the army of the United States during many years preceding the rebellion, and since then at some of its frontier stations, often deprived for months of any fresh vegetables, has shown very conclusively that there is no form of desiccated fruit or vegetable that can take the place of the fresh article, or that measurably possesses its virtues, all kinds having been tried, with always the same resultant failure. Substitutes for something fresh have proved of small account, except that they have been of benefit as an additional article of food, increasing variety in the diet, which is always beneficial, and thus fortifying the health and enabling the system to struggle for a time against the scorbutic tendency, but the latter is ultimately sure to have its culmination in scorbutus, unless fresh food can be provided for the relief of the impoverished blood, to afford it the nourishment of which it has been deprived.

A Few Rules for Dyspeptics.

1. Eat slowly, masticating the food very thoroughly, even more so, if possible, than is required in health. The more time the food spends in the mouth, the less it will spend in the stomach.
2. Avoid drinking at meals; at most, take a few sips of warm drink at the close of the meal, if the food is very dry in character.
3. In general, dyspeptic stomachs manage dry food better than that containing much fluid.
4. Eat neither very hot nor cold food. The best temperature is about that of the body. Avoid exposure to cold after eating.
5. Be careful to avoid excess in eating. Eat no more than the wants of the system require. Sometimes less than is really needed must be taken when digestion is very weak. Strength depends not on what is eaten, but on what is digested.
6. Never take violent exercise of any sort, either mental or physical, either just before or just after a meal. It is not good to sleep immediately after eating, nor within four hours of a meal.
7. Never eat more than three times a day, and make the last meal very light. For many dyspeptics, two meals are better than more.
8. Never eat a morsel of any sort between meals.
9. Never eat when very tired, whether exhausted from mental or physical labor.
10. Never eat when the mind is worried or the temper ruffled, if possible to avoid doing so.
11. Eat only food that is easy of digestion, avoiding complicated and indigestible dishes, and taking but one to three kinds at a meal.
12. Most persons will be benefited by the use of oatmeal, wheat meal, or graham flour, cracked wheat, and other whole-grain preparations, though many will find it necessary to avoid vegetables, especially when fruits are taken.

GLUTTONY AMONG GREAT MEN.—The fact that some men of genius have been prodigious eaters, in fact gluttons, has lead many to the erroneous conclusion that heavy food is essential for the best quality and greatest quantity of mental labor. A writer, who evidently holds this opinion, ridicules Charlotte Bronte because she became disgusted with Thackeray on seeing him eat, while sitting beside him at the table on the occasion of first meeting him, although she had formerly idolized him and worshiped his productions. Johnson, Dickens, Thackeray, Bayard Taylor, and other characters whom we might mention, were almost as notorious for their gormandizing as for their literary productions, but their literary fame was achieved in spite of their dietic abuses, rather than by their aid. It would be very easy to show that several of the literary characters named were cut short in the midst of their brilliant careers by habitual abuse of the stomach. A temperate life and a simple dietary would have enabled several of them to prolong their lives to the present moment, with increasing ability in the lines of literary effort for which they are celebrated.—*Good Health.*

PERSONS suffering with acid dyspepsia should avoid starchy foods and those containing sugar. Vegetables must be discarded for a time. Sugar and all articles containing it must be wholly discarded. The idea many people have that sugar neutralizes acid, is quite a mistake. The grains can be taken better than other farinaceous foods. Often fermented bread cannot be eaten without distress. Aerated bread, or light unleavened bread in the form of rolls, crisps, or crackers, is much preferable. Toasting until crisp and slightly brown renders bread much less likely to sour. Fermented bread should never be eaten until it is a day or two old.

COLD BATH IN TYPHOID FEVER.—The following paragraph shows more strongly than any argument can the utility of water as a means of subduing fever: "In Lyons, France, the cold bath method of treating typhoid fever has been adopted with marked success. In the civil hospitals the death rate was reduced from 26 to 9 per cent, and in private practice to 1 or 2 per cent." The method of application is fully set forth in the "Home Hand-book of Rational Medicine," published by *Good Health.*

CREMATION IN ITALY.—The immense crematory at Rome is in almost daily use. Cremation is daily becoming more popular, and bids fair soon to dispose of more corpses in the Italian capital than old-fashioned burial.

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SAN FRANCISCO:
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Passing Events.

Mining news of note is not abundant just now. Reports from the Yukon river, Alaska, tell of rich finds of diggings that pay $150 to the man per day. Other diggings 800 miles up the river are reported rich. How much truth there is in these stories it is impossible to tell.

The railroad men are still in conference in this city, and it seems agreed that the three great roads shall charge the same prices. We record elsewhere the death of a civil engineer who has gained distinction by his railroad work on this coast.

The fairs are still in progress in this city and the interior. Good attendance seems to be the rule. The famous North Bloomfield debris case is again going on in this city. It will be some time yet, however, before a decision will be reached.

QUITE a large number of new members are being enrolled in the Mechanics' Institute. Most of this increase is doubtless due to the plan adopted by the directors this year of furnishing members season tickets to the fair at half price—that is, $2.50 for double and $1.50 for single. The Institute was never in a more flourishing condition. The membership roll contains over 1,800 names. In the library there are 33,000 volumes, of which the circulating department has 16,000.

SUPT. THOMAS, of the old Dominion Copper Co., at Globe, Arizona, reports their August product from one of the Rankin, Brayton & Co.'s 30-ton smelters to be 403,810 pounds, an average daily yield of 13,460 pounds, bullion running 99 per cent. No comments are necessary on such a statement.

Cable Railroad Grips.

An item is going the rounds of the press concerning what is called an "improved cable grip" which is in use on the Brooklyn bridge, New York. The grip appears to be highly spoken of as a great improvement over those used in San Francisco and Chicago, and it is stated that the patent ante-dates all others.

To the casual observer it would seem that if this device of Col. Paine's was so superior to others it would have been in use in San Francisco where the cable railroad system was inaugurated and developed, more especially as it claims to have been the first of the grips.

This, however, is not the case. The Hallidie patent, in use on the Clay street railroad, was patented long before Paine's. It was granted July 6, 1872, and is numbered 129,130. The Paine patent was not filed until December 1, 1875, and was issued February 8, 1876. Hallidie's had been in use some three years before Paine's application was filed.

Two inventors, Hovey and Paine, applied separately about the same time for a patent on a roller grip, and Hallidie also applied, so an interference was brought about in the Patent Office. It seems that when Hallidie first experimented he had tried the roller grip, but had abandoned it for the one still in use on the Clay street road. He afterwards applied for a patent on the roller, probably to prevent others getting a claim. In effect, the decision of the Patent Office was that Hallidie had abandoned his idea, and he was thrown out; Hovey was given minor claims of construction, and Paine obtained the broad claims of the rollers as applied. It must be remembered, however, that the Hallidie grip already in use had rollers on it, and Paine's idea is not the use of rollers alone, but that of breaking on the rollers, or jamming the rollers on the cable. Hallidie's original patent was not affected in any way.

Hovey had very much the same appliance as Paine, in that the rollers grip the cable and no solid blocks are used. Theoretically, this idea is good, and it was not till Hallidie had tried it that he abandoned it in the first place.

The roller grip, therefore, is not new here, but has been tried and failed. Hovey's was tried several months in the fall of 1876, on the Sutter street cable road, when that road was opened. It was found that the rollers damaged the cable much more than the solid die which was in use on other roads. The same frames are now in use, but instead of rollers they carry solid dies. The difficulty with the rollers is this: The pressure is only applied to the cable at points as broad as the bearing surface of the rollers, and there is not bearing surface enough. The ropes get hard on the surface by wear, and the outer wires become quite brittle. With four nipping points the rope is liable to injury, while the broad bearing surface of the long dies causes no damage. This is the practical result, as shown in every day work.

The fact that this style of grip had been used here and failed, was known to the engineers in charge at the Brooklyn bridge, and the directors had the information placed before them long since. It seems strange, therefore, that it should have been adopted.

The experience on the cable roads in this State ought to be of the greatest assistance to others, as we have had several years' trial, and under various circumstances. One thing claimed for the roller grip is that it starts without a jerk. The cars here start gradually unless the engineer is careless. The Market street cable grip, for instance, has its upper die longer than the lower, and it presses the rope gradually on revolving *rollers* before the rope is pressed on to the lower die. When, however, the cable is finally gripped, it is held between two soft iron dies, which give a long bearing. Wood has been tried for this, but failed, splinters getting in between the strands and forming lumps. Brass is no better than soft iron, and is more expensive.

There is no jar or jerk at starting. They start in all sorts of places, among teams and people, and what is more, come to a stop from full speed of eight miles per hour inside of ten feet.

At Brooklyn bridge they have only a grade of three feet in 100. We run here on grades of 18 feet in 100. Our ropes are under ground, theirs above. We are confined by law to a three-fourth-inch slot through which to operate the gripping arrangement; they do as they like. We are required to stop at all kinds of places; they only stop at one station at each end. Our Market street cars run about eight miles an hour. We are told the Brooklyn cars run ten miles. We go through crowded thoroughfares, while they run over a private right of way. Talk is made of their carrying 57 passengers. The Market street cars have been over their grades with as high as 130 passengers on a car, and frequently carry 100.

In view of our experience here, it does not seem that the roller grip is going to be as great a success on the Brooklyn bridge as has been claimed for it.

Hurdy Gurdy Water Wheels.

In this number of the MINING AND SCIENTIFIC PRESS we publish an article on Hurdy Gurdy wheels by Mr. Ross E. Browne, of the University of California. The development of the Hurdy Gurdy wheel is, we believe, largely Californian, and this adds to the interest we feel in a comparison of designs and efficiencies, which shows the Pelton Hurdy Gurdy wheel to be a better wheel for high heads than the Partial Turbine.

The following additional points have been brought forward in this paper and verified by experiment:

1. With any Hurdy Gurdy wheel the best effect (the highest efficiency) is reached when the bucket has approximately one half the velocity of the water jet. The degree of this approximation depends mainly on the amount of water "carried" by the wheel; the less this amount, the closer the approximation. In the case of the Pelton wheel this rule will be found quite accurate.

2. The efficiency of the Hurdy Gurdy wheel with flat buckets (Fig. 17), can only approach 50 per cent in the same sense that the efficiency of the Pelton wheel approaches 100 per cent.

3. The curved bucket (Fig. 18) is a great improvement on the flat bucket (Fig. 17), and the division or wedge in the Pelton bucket is a further improvement of decided importance.

The following paragraph of Mr. Browne's report we append here, typographical exigencies preventing it appearing on the first page:

It is plain that the Pelton wheel, besides giving a higher efficiency than the Partial Turbine, above described, is more easily built, has a decided advantage in the setting of the nozzle, and is not so dependent on the precise size of nozzle used The capacity of either of these wheels may be doubled by adding another nozzle.

A Worthy Journal.

It is probably not necessary to call the attention of our readers to the character of the contents of the PRESS of late, nevertheless it is a satisfaction to do so. We have been giving a large amount of original correspondence recently, from our traveling and local correspondents, and this number shows how interesting such letters are. Our engravings of mining machinery and appliances have been new and very valuable to our readers. Within the past few months we have given a great many engravings and descriptions of appliances of the highest interest to the miner and metallurgist. The articles in last week's PRESS and this number, on water wheels, with full illustrations, are of great scientific and practical value, and no doubt will be appreciated by all mining men.

It is our aim to obtain from every possible source all reliable information on such topics as will interest the miner, metallurgist and mechanic. In fact, the MINING AND SCIENTIFIC PRESS is the only mining paper published which makes a specialty of illustrating and describing the details of mechanical appliances of mining. Bound volumes of the PRESS are of a far more practical value than most books, inasmuch as so wide a range is covered, and all the latest appliances described.

In addition to these things, all the current mining news is given, and a record of scientific and mechanical progress, each week.

It is gratifying to us to know that these efforts of the publishers are appreciated by the readers. Yet there are many mining men who should be constant readers of the PRESS who do nothing toward upholding it. It is not too much to ask of those who are readers to call the attention of others to its merits. The better our patronage, the better journal can we make. The impartial judgment of any intelligent man will lead him to appreciate the PRESS, should he but glance over the columns of a few numbers. The assistance of old subscribers is therefore of great advantage to the paper, and we shall be very glad to have it whenever opportunity offers.

New Concentrator.

David H. Anderson, of Butte, Montana, has patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, a new form of ore concentrator, which consists of a series of circularly moving and rocking pans placed on descending steps, each one receiving the discharge from the one above it, through suitable gates, chutes, and receivers; and in connection with these, suitable mechanism is employed to operate them.

The pulp is let into the upper pan, and distributed and settled by the peculiar motions imparted to it, the heavier particles settling to the bottom and the lighter arranging themselves above, and flowing through the openings at the side into the distributor, and thence into the next pan.

If it be desired to amalgamate the free gold and silver at the same time that the concentration is being accomplished, mercury may be placed in one or more pans. The heavier metals—gold, silver and mercury—will thus remain at the bottom of the first pan, and the lighter metals (if there be any), sulphurets, sand, loam, or other debris, will be discharged through the distributor into the next pan, where the heaviest will be again settled, and so on to the end of the series, so that all the different grades and values will be separated at one operation.

In some cases a parallel circular motion may be given the pans, and in others a compound circular motion. Either can be given by the mechanism provided for it. The object of the parallel circular motion is to move the vessel equally in all directions, thereby imparting to the pulverized ore, sand and debris, an even movement as they pass over or through the vessel. The object of the compound circular motion is to agitate the passing material, mostly in a sidewise or oscillatory manner, around the center of the pan, while creating but little motion in the direction in which the material flows across the vessel. This movement is specially useful for saving the lighter metals, and gives the machine a better settling action, which the inventor terms the "parallel motion."

Mexican Iron Ore.

Several tons of iron ore were brought to this city a few weeks since from Mexico, with the expectation that it would be utilized by the Pacific Rolling Mills. The ore is found at a place called Tepuche, ten miles from Culiacan, which city is thirty-eight miles from Altata, the seaport, 130 miles north of Mazatlan. The ore runs about six to eight per cent metal, and there are large quantities of it. It assays better than the product of the Iron Mountain, of Durango, Mexico, there being more iron and less phosphorus. There is so little phosphoric acid that steel can be made directly from the ore.

The mountain from which this comes is in the midst of a hardwood forest, so there is plenty of fuel. It is in a limestone country, also, a very great advantage. Both fuel and labor are cheap. A railroad has been in operation for a year between Culiacan and Altata. The latter place has a good inclosed harbor, though there is a bar with but from fifteen to seventeen feet of water, all properly buoyed. Once inside this, there is plenty of water for vessels.

The demand for iron on the Mexican coast is constantly increasing. The duties on all classes of manufactured iron are high, so it would probably pay to establish works for making iron. Our informant, Mr. J. D. Schuyler, General Superintendent Sinaloa and Durango Railroad, thinks the iron can be made there to compete in this market. An experienced iron worker from Tennessee, who examined the iron and the deposit, is certain that pig can be turned out for $12 per ton. It would cost very little to put a tramway or branch railroad from Culiacan to the deposit, there being a level valley only to traverse.

There are a few other iron deposits similar to this in the same region. There is one twenty-five miles from Culiacan that assays even better than this to which we have referred. Nothing has ever been done with the iron deposits of that country. There are only two or three iron smelting plants in the whole of Mexico. Iron made in the locality mentioned would be very cheap for the whole Mexican Pacific coast, being free from duty. There is now a line of steamers on the coast, and next year the service will be increased.

A Portable Furnace and Assay Outfit.

Something new, practical and cheap for prospectors and assayers is Tappeiner's combined portable assay furnace and assay outfit. The furnace, which is shown in the engravings, is made of sheet iron, with three openings in front. One of these is for the muffle, one for inserting picks and drills for sharpening, and the third to reach the ash pit. Each is provided with a hinged door. The furnace is twenty-four inches high without the pipe, and ten inches in diameter at the largest or swell part. It is lined with fire clay fastened so it will not crack off. The form is tapering, with the largest diameter near the top, so as to give room for the muffle and crucibles where most needed. There are four joints of pipe reaching six and a half feet above the furnace, made tapering, so that the four joints telescope one within another, and all are placed within the furnace small end down while being transported, and held in by the furnace cover, which is provided with a suitable fastening.



Ready for Use.

The lower or larger section of the pipe has a large door through which to feed coal and remove crucibles. The pipe projects vertically from the center of the furnace top so there is a direct upward draft. The base of the furnace is broad to give it steadiness, and is braced by strong iron rings inside, so as not to be crushed in transporting.

The following assay implements, etc., accompany each furnace, and are all packed within the furnace in and around the pipe, so the furnace occupies no more room when packed than before: A hammer, iron mortar and pestle, magnifying glass (for examining ores and reading graduations on button-measuring scale), brass wire sieve (No. 60 with tin frame), pulp scale, four No. 7 English crucibles and three covers, pair of combination tongs (for lifting crucibles, scorifiers and cupels), assay pouring mold, iron muffle, iron cupel mold (1¼ inch), tin box and can for crucibles and scorifiers, scale for measuring silver buttons, half a dozen test tubes, pair of wooden test tube tongs, bottle of C. P. nitric acid packed in a tin box with a screw cover, three tin flux boxes with covers and partitions for eight fluxes. The following fluxes also accompany the outfit: litharge, bicarbonate soda, borax, chloride of sodium, argols, bitartrate potass, borax glass, and granulated lead.



Packed Up.

A book of instruction also accompanies each outfit, describing the use of the implements and fluxes and mode of making and calculating the assays of gold, silver, lead and copper. John Taylor and Co., 118 and 120 Market street and 15 and 17 California street, of this city, are the sole manufacturers and agents for this furnace and implements under the patent for the United States. The price of the outfit complete is $40, so it is not too expensive for prospectors.

IT is stated that San Francisco parties have bought the Eureka Con. Mining Co.'s slag pile at Eureka, Nev., and that the entire dump will be run through a new style of furnace again. It is estimated that there are about 1,000,000 tons of slag in the dump, which may pay handsomely, as when the furnaces were first started the process of smelting was crude. Tests of the new process will be made with the present furnaces of the Eureka Con., and if satisfactory, new works will be erected immediately.

OUR PRODUCTS.—During the first eight months of this year the through freight of the Central and Southern Pacific Railroads have included the following amounts of mining produce: Borax, 2,315,700 pounds; copper cement, 599,400 pounds; pig iron, 263,700 pounds; lead, 1,962,300; quicksilver, 252,600. This went from this State to the East.

Mining Debris.

A short time since we gave the resolution adopted by Sacramento officials, asking the Secretary of War to withhold the money appropriated by Congress for improving the river where mining debris is dumped. The following resolution, adopted by the Board of Trustees of Nevada City, Nevada county, in this State, are of exactly the opposite tenor:

Resolved, That the mining in this county is an industry of paramount importance to our people, and if the efforts of the anti-miners in a portion of a few valley counties are successful, our greatest industry will be closed and our county depopulated, and a large portion of our hard-earned wealth and the comfort of our people will vanish.

Resolved, That we point with pride to the result of our mining industry in the shape of flourishing cities and villages, as well as to our numerous school houses and comfortable homes which are scattered broadcast over our broken and rough territory, and we challenge the State to exhibit more industrious and law-abiding people than are found in the mining counties of this State.

Resolved, That our people feel that mining in any shape is a lawful industry, and we deprecate in all ways as unworthy the acts and efforts of the Anti-Debris Association to prevent the Secretary of War from allowing the appropriation of Congress to be applied towards the amelioration of the injuries which our industry may have caused to a limited number of the citizens of the State in the valley below us.

Resolved, That an industry which has turned into the channels of commerce the sum of $1,200,000,000 in gold, and which can furnish a still larger sum, is certainly worthy of protection by our government, which has in all ways profited so largely by it, and which has as yet never contributed one dollar to its aid or protection.

Resolved, That we consider it the duty of the Secretary of War to allow the appropriation made by Congress to be speedily applied to the object for which it was set aside, and that we thank the generous miners on the Yuba for their frank offer to the government to furnish $125,000 (if the government will furnish an equal amount), to be expended, by the War Department, on the Yuba river, in constructing dams for impounding debris, which we know by the examination of unprejudiced engineers is practicable.

FIG. 21.

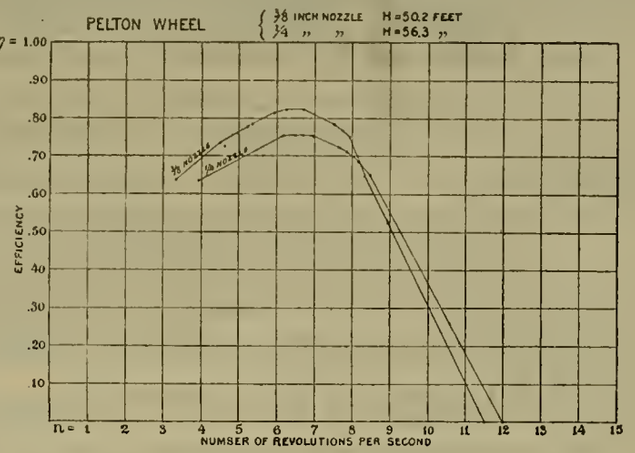


FIG. 22.

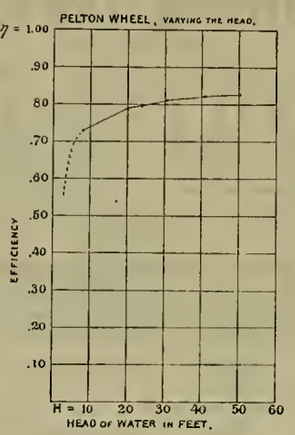
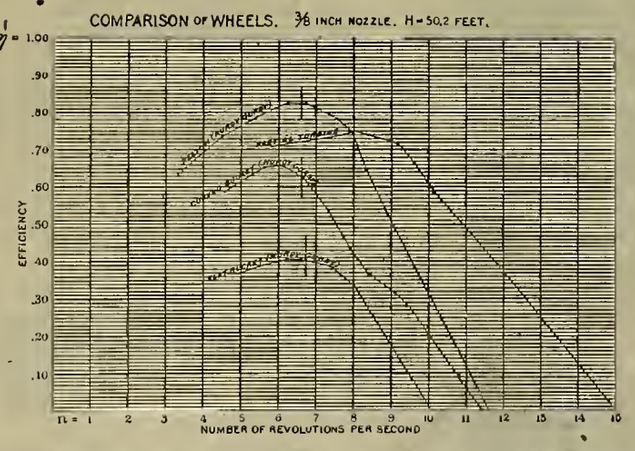


FIG. 23.



DIAGRAMS SHOWING WORK OF HURDY GURDY WHEELS.

IT is reported that Alvinza Hayward has purchased B. S. Tyler's farm on the South Fork of the Cosumnes river, and intends building a dam across the river to furnish water for his Plymouth mines during the dry season. The dam will be 40 feet high with a 300 foot base.

WE shipped East this year 132,500 pounds of nails.

Blasting in Mines—No. 9.

Charging and Firing.

The operations of charging the holes and firing the shots demand particular attention when machine labor is employed. Holes bored by machine drills cannot be placed or directed strictly in accordance with the requirements of the lines of least resistance; on the contrary, these requirements can only be approximately complied with, and in some cases must be wholly neglected. To compensate in some degree this defect of machine labor, the strength of the charges should be varied according to the resistance which they will be required to overcome. That is, the principles of blasting described in a former number, which cannot be complied with by the borer, should be strictly followed by the blaster in apportioning his charges. By this means, a great saving of the explosive compound may be effected, and that without difficulty or loss of time, if the blaster be intelligent and understand his work. A glance will be sufficient to show what charge a given hole of a known depth will require, and as cartridges of different sizes are ready at hand, no delay is occasioned in making up the charge. The holes in the center, which are intended to unkey the face, will of course require the heaviest charge, since the conditions are there most unfavorable to the effects of the explosion. And the more complete the unkeying resulting from this first explosion, and the more fractured and jointed the rock surrounding the cavity thus formed, the more may the charges placed behind these unsupported faces be reduced.

As economy of time is in machine boring the chief end to be attained, the tamping should be done with dried clay pellets previously prepared. This material gives the greatest resistance, and thereby insures the maximum of useful effect; and if prepared beforehand, in the manner described in the preceding chapter, the time consumed in tamping will be reduced to a minimum. An abundant supply of such pellets should always be ready at hand. In downward holes, such as are used in shaft-sinking, the plastic clay pellet and sand may be employed. This tamping may be put in very rapidly, and, in all but very shallow holes, it is very effective. When it is desired to use sand tamping in horizontal holes, and holes bored in an ascending direction, the sand should be made up in paper cartridges. The tamping employed in the St. Gothard tunnel consisted of sand prepared in this manner. At the Mont Cenis tunnel, an argillaceous earth was similarly prepared in paper cartridges for tamping.

Firing the charges also affords an occasion for the exercise of knowledge and judgment. A skillful determination of the order in which the charges are to be fired will in a great measure compensate the ill effects of badly placed holes. The firing of a shot leaves the surrounding rock more or less unsupported on certain sides; and it is evident that to profit fully by the existence of these unsupported faces, the succession of explosions must be regulated so that each shall have the advantage of those formed by the preceding shots. This condition can be wholly fulfilled only by simultaneous firing; but when the firing is to take place successively, the condition may be approximated to by regulating the succession according to the indications observed in a careful inspection of the rock. Before firing the charges, the blaster should consider the relative positions of the holes, the stratification and jointing of the rock, the fissures caused by the preceding blast, and any other circumstances that may influence the results. The charges intended to unkey the face will be fired first, and those in the concentric series will then be fired in the order determined upon, by means of different lengths of fuse. The series will follow each from the center outwards. When a large number of shots regularly placed in series have to be fired, a convenient practical means of insuring the successive explosion of the series, in the case of the whole being lighted simultaneously, consists in bringing the fuses from all the shot-holes together in one point at the center. This method of regulating the length of the fuses was adopted at the St. Gothard tunnel.

MINT DIRECTOR BURCHARD states that from his recent observations and information he has received, he thinks this year there will be a slight decline in the yield of gold, and an increase in silver over last year's production.

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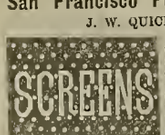
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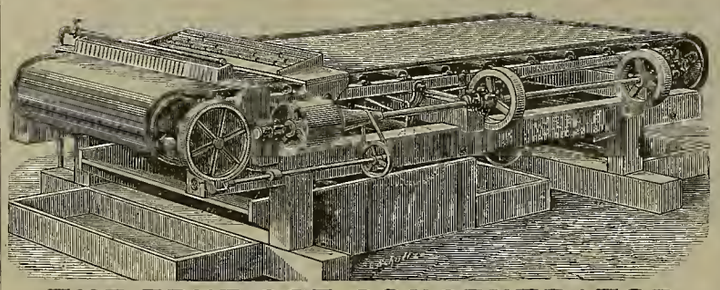


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That legal advice has been given that *all shaking motion* applied to an *endless traveling* belt used for concentration of ores is an infringement on patents held and owned by the Frue Vanning Machine Company.

That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.

That the patent laws make *users* of infringements responsible as well as makers, and the public is therefore warned that there is considerable risk in purchasing any end-shake machine until our various patents have been decided.

That if there are those who for any reason prefer an end-shake machine, we can manufacture and sell to such machine of that description, as efficient as the Triumph, and at a lower price, and no liability for infringement will then be incurred by the purchaser.

That we shall protect ourselves against any one making, selling or using any machine infringing any of our patents. Patented July 9, 1867; May 4, 1869; Dec 22, 1874; Sept. 2, 1879; April 27, 1880. Patents applied for.

That we are, and have been, ready at any time, to make a competitive trial against the Triumph, or any other machine, for stakes of $1,000.

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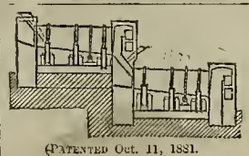
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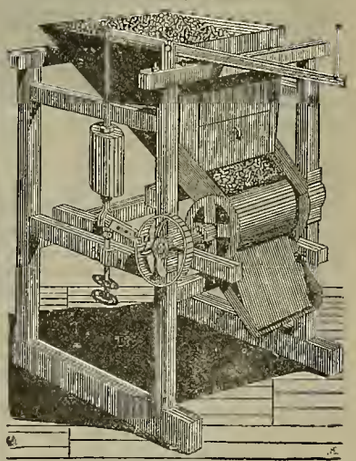
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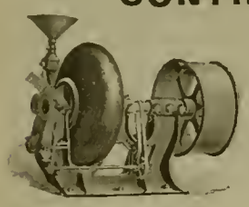
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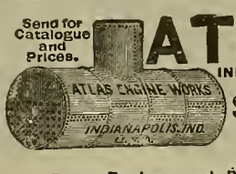
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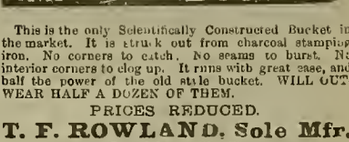
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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & CO.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING SEPT. 18, 1883.

285,097.—AUTOMATIC SAFETY HATCH FOR ELEVATOR SHAFTS—Henry Albert, Newcastle, Cal.

285,340.—DREDGER HOPPER—John A. Ball, Oakland, Cal.

284,996.—HORSE HAY RAKE—J. R. Bane, Gilroy, Cal.

285,110.—ORE CONCENTRATOR—Carter & Adams, S. F.

285,111.—DRY GOLD SEPARATOR—S. C. Chaney, Chico, Cal.

285,112.—PORTABLE CHIMNEY—L. E. Clawson, S. F.

285,238.—SULKY—P. F. Dean, Watsonville, Cal.

285,260—METALLIC FASTENER—H. Harris, Suisun, Cal.

285,032.—WHIFFLETREE—M. D. L. & J. M. Hartley, San Diego, Cal.

285,262.—CAR COUPLING—C. Hendricks, Modesto, Cal.

285,046.—SHIRT—L. Lemos, S. F.

285,151.—PAINT—A. L. Munson, Fresno, Cal.

285,152.—BUNCHING SHINGLES—A. L. Munson, Fresno, Cal.

285,153.—TWO-WHEELED VEHICLE—J. P. Muttersbach, Hicksville, Cal.

285,075—SINKER FOR FISHING TACKLE—Hale Rix, S. F.

285,179.—JOINT FOR EARTHENWARE PIPES—John S. Tibbals, S. F.

285,180.—BACK-WATER GATE FOR SEWERS—John S. Tibbals, S. F.

285,193.—CULTIVATOR—H. Wilcox, Los Gatos, Cal.

285,194.—HEEL FOR BOOTS, ETC.—Sam'l. Wilde, Williams, Cal.

285,195.—DRAWERS—Geo. Wittman, S. F.

3,529.—LABEL—C. H. Hammit, Oakland, Cal.

3,537 to 3,539.—THREE LABELS—C. L. Williams, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

JOINT FOR EARTHENWARE PIPES.—John S. Tibbals, S. F. No. 285,179. Dated, Sept. 18, 1883. Earthenware pipes and others of like character are generally made in sections of varying length, each having a straight end and a flaring end, the latter of which is known as the "flange." In laying such pipe, the straight end of one is inserted in the flange of the one adjoining, and the two are held together by cement filled in between so as to form a tight joint, but this joint is imperfect as far as holding the pipes together is concerned, for with a sudden force in the direction of their length, the joint, having no other security than the adhesion of the cement, is apt to be loosened. The object of this invention is to provide a joint adapted to resist such force and at the same time to be perfectly water-tight. The invention consists in flanges or shoulders molded, cast, or secured on each section of pipe near each end, and in a cap or covering bolted over the joint and fitting behind the shoulders. Cement intervenes, and is molded tightly to its place by the cap,

BACKWATER GATES AND SEWERS.—John S. Tibbals, S. F. No. 285,180. Dated, Sept. 18, 1883. This is a new and useful gate to prevent tide-water, etc., from backing up into the sewers, or to resist any hydraulic pressure which may be applied in flushing, and it consists of a swinging valve within a pipe or casting let into the sewer and adapted to close the passage and as a means for operating said valve, consisting of a float and mechanism connecting it with the valve, said float being within a water box connected with the lower end of the pipe whereby the rise of the water will operate to close the valve. The object is to provide simple and effective means to prevent the water from backing up into the sewer when the tide rises or when the flushing is in progress.

BUNCHING SHINGLES.—Anson L. Munson, Fresno, Fresno Co., Cal. No. 285,152. Dated Sept. 18, 1883. The object of this invention is to facilitate the process of dipping to which the the shingles are subjected to coat them with paint or other protective material. The method of bunching consists in placing between the shingles and on the line of their lap or bond, a number of transverse slats or stringers. The present manner of bunching shingles is to lay them one on another from each side with their laps touching, and then to bind them firmly together with the clamp or yoke, which is well known. This makes a solid and compact bunch, and is well enough where the dipping process is not resorted to. But for this process the yoke must be removed, and each shingle dipped separately, and the difficulty cannot he remedied so long as the present manner of bunching shingles continues. The present bunch cannot be dipped as a whole because the shingles are bound so firmly together that the paint will not reach their surfaces. In this way of bunching the paint enters between the shingles, and the entire surface of each up to its lap is exposed to its action.

AUTOMATIC SAFETY HATCH FOR ELEVATOR SHAFTS.—Henry Albert, Newcastle, Placer Co. No. 285,097. Dated September 18, 1883. The object of this invention is to cut off or separate each floor by automatically operating hatches, to prevent the spread of fire or the communication of drafts and fumes, and to avoid accidents by persons falling through the elevator-shafts. The improvements consist of a two-part hatch at each floor, mounted on friction rollers, and meeting in the center of the shaft when closed. These batches are separated by V-shaped cams on the traveling eage, and returns to position by force of gravitation. They are so constructed that while gravitating together they shall always lie in a horizontal plane.

CULTIVATOR.—Harvey Wilcox, Los Gatos, Santa Clara Co., Cal. No. 285,193. Dated Sept. 19, 1883. This is an improved apparatus for cultivating the soil, which is specially applicable to land between rows of trees, vines, etc., and upon hillsides, and it consists of a frame having teeth or a cutting blade or blades, and a rigid pole or shafts for the attacbment of a horse. In combination with this is a rolling cutter or colter mounted on one end of a lever, so as to travel in the ground near the cutter or cultivator, while the upper end of the lever is adjustable from right to left, and may also be moved vertically, to throw the colter out of or into the ground.

PAINT.—A.L. Munson, Fresno, Fresno Co. No. 285,151. Dated September 18, 1883. This paint compound is specially adapted for painting roofs, dipping shingles and for use as a cement. It consists of coal tar, litharge, hydrochloric acid in which zinc is dissolved, plumbago, asphaltum, varnish and gasoline in certain specified proportions. It protects exposed metallic surfaces, preserves wood, may be used in coating cemented walls, and as a coat for brick walls. It is water proof, has no odor, is not affected by beat, and will not crack.

DRAWERS.—Geo. Wittman, assignor to D. Nustadter, San Francisco. No. 285,195. Dated September 18, 1883. This improvement in drawers for underwear consists in a means for re-enforcing or strengthening the front opening at the point where the sides meet; and it also consists of two independent facing strips extending down upon opposite sides of the front opening, and having tongues which extend across and overlap each other just below the meeting edges of the opening.

PORTABLE CHIMNEY.—L. E. Clauson, S. F. No. 285,112. Dated, Sept. 18, 1883. This improvement in chimneys consists in the formation of portable sections of pottery made with inclosing metallic easings, these sections having uniting couplings, and in connection with these sections, thimbles into which stovepipes may be inserted.

IMPROVED WATER DISTRIBUTION.—At Redlands, San Bernardino Co., I believe the experiment was first tried of distributing water to irrigators through a complete system of concrete pipes. The plan has proved a most pronounced success. Southern California owes much to the Messrs. Judson and Brown for demonstrating that a constant flow of one inch of water under a four inch pressure is amply sufficient to irrigate thoroughly eight acres of land. The fact is of great value to our part of the State. I believe there is no colony in the State that has a more satisfactory water system. This is appreciated by those who know that in our climate water is more valuable than land. Now, Redlands has a splendid soil, a charming location, and a climate unsurpassed, but probably its unrivaled water system has had more to do with its rapid progress than any other one item.

The young trees and vines are strong and vigorous. The soil of this colony is peculiarly well adapted to the Muscat grape, the orange and the apricot. Most of the land is sold and is being rapidly brought under cultivation. The colony is well supplied with storage reservoirs so that it is never necessary to irrigate of nights or on Sunday. When will the older settlements profit by her example?—*Cor. Los Angeles Express.*

FOREST fires north of Santa Cruz are doing great damage. Virgin forests of redwood, tan-bark oak and thousands of acres of feed, besides cordwood, shakes, pickets, etc.—in many cases the fruits of mouths of labor of poor men—have been destroyed.

Death of an Engineer.

S. S. Montague, widely known on this coast as Chief Engineer of the Central Pacific railroad, died this week at the end of the track of the California and Oregon railroad beyond Redding. Deceased was about fifty years of age, and leaves a wife and family of children living in Oakland. He entered the employ of the Central Pacific Railroad Co. early in its history as assistant to Chief Engineer Judah, who died shortly after the commencement of the company's great work, and surveyed the route across the Sierra. In making this route he accomplished feats then without a parallel in railroad engineering, gaining an elevation of seven thousand feet in seventy or eighty miles and dropping down three thousand feet in twenty-five miles into the Truckee basin. He was Chief Engineer of the San Joaquin valley railroad as far as Gosben, and the California and Oregon roads, his death occurring while at work exteuding the latter road north into Oregon. He selected all the routes, ran all the lines and made all the grades of these roads.

The Central Pacific is an enduring monument of his engineering genius. English surveyors had come over here, and after seeing the obstacles to be overcome, and the nature of the country the road was to traverse, announced its accomplishment an impossibility; yet to-day the cars round "Cape Horn" and skirt Blue canyon at dizzy heights with perfect safety. He conquered the rugged ridges and the winter snow avalanches with sixteen or seventeen tunnels, and about thirty or forty miles of snowshed. Chief Engineer Judah died March 11, 1863, just after the first ground had been turned for the construction of the Central Pacific railroad. The work of construction began January 1, 1863, so that Mr. Judah had little more than two months' superintendence of the actual work. He had, however, surveyed the line some distance east, in which work Mr. Montague had assisted. After his death Mr. Montague had full charge of the work, although he was not regularly elected Chief Engineer until March 31, 1868. He had the peculiarity of not being wedded to theories or traditions, but struck out boldly, and carried out many things which to older engineers seemed impossible. Messrs. Stanford and Crocker, the managers, would often state that they would like the road to run to such and such a place, and through a given country. Although the authorities would say that this could not be done, and notwithstanding that older men would resign rather than oppose such authorities, Mr. Montague would at once set about the work of discovering how the work could be performed, and usually succeeded in carrying out the directors' wishes.

State Fair Notes.

Thomas Henning and brother, of No. 511 N street, Sacramento, exhibited a very handsome and seemingly well constructed device for manufacturing gas from naphtha. It was one of the finest mechanical attractions of the fair, if not the most important. From a tank outside of the building naphtha is forced in small particles into the machine and instantaneously converted into gas, and held in a small receiver. When the gas is nearly all consumed, the operation is repeated automatically. In this manne the supply is constant, with only a limited quantity of gas on hand at auy one time. It seems a safe, simple, and very ingenious invention. It occupied less space than au ordinary cooking stove; has a capacity of 40 burners and is claimed to furnish gas at one dollar per 1000 cubic ft, or less. In large country houses, halls, mines, etc., it would seem to be very desirable.

The Judson Manufacturing Co.'s Victor mowing machine, in the display of A. Hielbron & Brother, agricultural hardware dealers of Sacramento, as a superior and popular California manufacture. It was evidently highly appreciated, as well as other articles shown by Messrs. H.

One of the most strikingly novel California inventions shown was Clarence Sanborn's differential chain pulley which seems to be a decided improvement on all former constructions of hoisting pulleys. It is composed of less parts, is very strong, easily operated, simple and cheap in construction. The inventor is a Sacramentan who made the discovery in the endeavor to provide for his own use a cheaper article than any in the market. The invention is likely to meet with marked success.

A. Meister, of Sacramento, displayed a fine variety of buggies, phaetons, and other home-made vehicles. His exhibits from year to year show progress in inventive skill and industry.—*Rural Press.*

That Case.

EDITORS PRESS:—He that can cause his fellow man to laugh in this "vale of tears" is certainly a benefactor of his race, second only to the one who makes two blades of grass to grow where only one grew before. Having succeeded in "amusing" your correspondent, Mr. Cooper, I rejoice in the conviction that I have not lived in vain. I should almost be tempted to set up as a comic writer but that I should fear the competitiou of your correspondent.

Let Mr. Cooper but persevere and he will certainly "astonish the world;" he will paralyze the world if he can become a millionaire through the means of being a scientist.

Many of your readers, myself among them, will sympathize with Mr. Cooper in the matter of the *toddy*. It is greatly to be deplored that those bungling harvesters should spill so much good wheat, but granting the truth which your correspondent seems desirous of enforcing, that we (precious) metallurgists do our work quite as well on the whole as the farmers, mechanics, and artisans do theirs, I still fail to see any reason why we should not try to improve. In answer to Mr. Cooper's question, I will say that if he will work his lead ore in an amalgamating pan with quicksilver, a little sulphate of iron and some salt, also, of course, hot water, I have little doubt of the possibility of recovering at least 80 per cent of even so little as 3 or 4 pennyweights of lead (profit aside). It may be neeessary to roast the ore first. I advise him to make this experiment.

I don't quite understand the drift of the last question. Perfection in the application of a method would scarcely be a warrant for throwing that method aside, but in reply to what I take to be his meaning, I will quote the sailor's maxim, "Never let go of one hold until you have secured another." C. H. A.

GEOLOGICAL SURVEYS.—The Powell United States Geological Survey report has been made for the fiscal year. An area of 70 square miles has been surveyed in the southern Atlantic regions, and good progress was made in the Rocky Mountain district, by surveys in the Platte region, Utah, Arizona, and New Mexico. In the Pacific district, the work outlined includes a survey of the Cascade Mountains in Oregon, Northern California, and Washington Territory. In California, about 2,000 square miles of country have been surveyed. The work was one of great difficulty. Researches in mining districts of Colorado have been made by S. F. Emmons, and promise to throw light on the theory of veins and the relation of eruptive rocks with which they are associated. In the Gunnison district, valuable beds both of anthracite and bituminous coal, unsurpassed in Colorado, have been found, and promise to make that locality one of the most important in the State. The ore bodies of this district also appear to be of much importance. The results of the investigation of minerals collected in Colorado have proven to be of great value to geology, so much so as to have elicited the commendation of investigators both in this country and Europe. The reconnoissance of the California quicksilver districts has been begun, and the work is being energetically prosecuted.

EVERYBODY is using, and everybody is recommending to everybody's friends, Brown's Iron Bitters as a reliable iron medicine, a true tonic.

NASH GRAIN CLEANER.—Mr. Nash, who has constantly continued to manufacture his original and popular farm machine, at No. 906 K street, Sacramento, was too well crowded with orders to exhibit at the late State Fair. He has lately filled liberal demands from Arizona and New Mexico. For the latter place he ships them in "knock-down" packages, suitable for transporting into the interior on muleback.

Successful Patent Solicitors.

As Dewey & Co. have been in the patent soliciting business on this coast now for so many years, the firm name is a well-known one. Another reason for its popularity is that a great proportion of the Pacific coast patents issued by the Government have been procured through their agency. They are, therefore, well and thoroughly posted on the needs of the progressive industrial classes of this coast. They are the best posted firm on what has been done in all branches of industry and are able to judge of what is new and patentable. In this they have a great advantage, which is of practical dollar and cent value to their clients. That is this understood and appreciated is evidenced by the number of patents issued through their SCIENTIFIC PRESS Patent Agency (S. F.) from week to week and year to year

THE C. P. R. R. carried East the first eight months of this year—through freight—219,300 pounds of powder.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions The pavilion has new varieties of performances The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

INFORMATION is wanted at this office of one Joseph Craig, formerly of Cass county, Illinois, who came to California in 1849.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $4 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turning a leaf.

Smelting Lead and Copper Ores.

The following letter will be read with interest by all in any way connected with the reduction of smelting ores. Mr. Center is widely known throughout the West as one of the most accomplished, practical and scientific metallurgists in the country and is regarded as high authority in all matters relating to the reduction of either copper, lead or galena ores according to the most approved methods of modern practice:

SAN FRANCISCO, August 25, 1883

Messrs. Rankin, Brayton & Co. — Gentlemen: In reply to your request for a statement as to the practical working of such of your copper and lead Water Jacket furnaces as have come under my observation, would say that in the course of a long and varied experience in the reduction of smelting ores, covering a period of some 15 years, I have had to do with a large number of your furnaces and have watched with much interest the results of your various experiments and improvements in this direction, during the time mentioned.

Your Water Jacket smelters, as now constructed for both argentiferous lead and copper ores embrace many new features of great utility, and, in my judgment, the most valuable principles of arrangement and construction that have ever been applied to this process. I have run them under a variety of conditions, involving in many instances the most severe tests that such work is ever subjected to, with invariably satisfactory results, proving beyond question their perfect adaptation to all the wants of this great interest. Your system of water circulation is one of so much importance as affecting the wear and service of the jacket, that no one at all familiar with its operation, would on any account dispense with it. Considered from a practical standpoint, the important thing in a smelting furnace is its capacity for continuous work under all ordinary conditions. That you have accomplished this great desideratum the construction of your smelters is a fact that admits of no question. A furnace that has to be blown out every few weeks for repairs is one that no company can afford to run. Every day's suspension from work represents a large loss in running expenses, as well as loss of product, involving with cost of repairs, charges so serious as to bring disaster to any mining company. It is a well-known fact that badly designed and imperfectly constructed machinery has hopelessly involved many of the most promising enterprises in the country. Several other features of your furnaces are also worthy of special consideration, which, in combination with those already noted, make them unquestionably the most economical and successful appliances for reducing smelting ores now in use in any part of the world. Yours truly,

GEORGE L. CENTER.

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, Sept. 27, 1883.

ANTIMONY Per pound	14 @	15
IRON—American Pig, soft, ton	30 00 @	–
Scotch Pig, ton	26 00 @	27 00
American White Pig, ton	@	–
Oregon Pig, ton	@	–
Clipper Gap, Nos. 1 to 4	32 50 @	35 00
Refined Bar	4 @	–
Horseshoes, keg	5 50 @	–
Nail Rod	7½@	–
Norway, according to thickness	8½@	7
STEEL—English Cast, lb	16 @	25
Black Diamond, ordinary sizes	14 @	–
Drill	15 @	16
Machinery	12 @	14
COPPER Ingot	22 @	–
Sheet	31 @	35
Sheeting, planed, 14x18	22 @	23
Nails	17 @	–
Bolt	31 @	–
Rod	8 @	–
Bar	@	–
Cement, 100 fine	15@	–
LEAD Pig	4½@	4¾
Bar	6 @	–
Pipe	7 @	–
Sheet	8 @	–
Shot, discount 10 on 500 bags: Drop, ₱ bag	2 10 @	–
Buck, ₱ bag	2 30 @	–
Chilled, do	2 50 @	–
TIN PLATES Charcoal	7 55 @	–
Coke	5 50 @	5 75
Banca Tin	25 00 @	–
Australian	25 00 @	–
I. C. Charcoal Roofing, 14x20	6 50 @	6 80
ZINC By the cask	19 @	–
Sheet, 7x3 ft, 7 to 10 lb, less the cask	90 @	–
NAILS Assorted sizes	3 30 @	4 75
QUICKSILVER By the flask	34 5@	35
Flasks, new	1 05 @	–
Flasks, old	85 @	–

IRON in a colorless state and Peruvian bark, combined with well known aromatics, make Brown's Iron Bitters the best medicine known.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

M. P. OWEN—Santa Cruz county.
J. W. A. WRIGHT—Merced and Tulare counties.
JARED C. HOAG—California.
B. W. CROWELL—Colorado, Utah and Montana.
M. H. JOSEPH—Eureka, Nev.
I. M. LEIBY—San Bernardino and San Diego counties.
J. J. BARTELL—Santa Clara county.
H. W. FOLSOM—Los Angeles county.
C. E. CURTIS—Kern and Inyo counties.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing only one cent) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent.

STRONG FACTS!

A great many people are asking what particular troubles BROWN'S IRON BITTERS is good for.

It will cure Heart Disease, Paralysis, Dropsy, Kidney Disease, Consumption, Dyspepsia, Rheumatism, Neuralgia, and all similar diseases.

Its wonderful curative power is simply because it purifies and enriches the blood, thus beginning at the foundation, and by building up the system, drives out all disease.

A Lady Cured of Rheumatism.

Baltimore, Md., May 7, 1880.
My health was much shattered by Rheumatism when I commenced taking Brown's Iron Bitters, and I scarcely had strength enough to attend to my daily household duties. I am now using the third bottle and I am regaining strength daily, and I cheerfully recommend it to all.
I cannot say too much in praise of it. MRS. MARY E. BRASHEAR, 173 Presidio st.

Kidney Disease Cured.

Christiansburg, Va., 1881.
Suffering from kidney disease, from which I could get no relief, I tried Brown's Iron Bitters, which cured me completely. A child of mine, recovering from scarlet fever, had no appetite and did not seem to be able to eat at all. I gave him Iron Bitters with the happiest results.
J. KYLE MONTAGUE.

Heart Disease.

Vine St., Harrisburg, Pa.
Dec. 2, 1881.
After trying different physicians and many remedies for palpitation of the heart without receiving any benefit, I was advised to try Brown's Iron Bitters. I have used two bottles and never found anything that gave me so much relief.
MRS. JENNIE HESS.

For the peculiar troubles to which ladies are subject, BROWN'S IRON BITTERS is invaluable. Try it.

Be sure and get the Genuine.

Scientific, Mining and Other Valuable Books.

PUBLISHED OR ISSUED, WHOLESALE AND RETAIL, BY DEWEY & CO., MINING AND SCIENTIFIC PRESS OFFICE, S. F.

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MINING ENGINEER AND METALLURGIST.

CONCENTRATION OF ORES (of all kinds), including the Chlorination Process for Gold-bearing Sulphurets, Arseniurets, and Gold and Silver Ores generally, with 120 Lithographic Diagrams. 1867.

This work is unequaled by any other published embracing the subjects treated. Its authority is highly esteemed and regarded by its readers; containing, as it does, much essential information to the Miner, Millman, Metallurgist, and other professional workers in ores and minerals, which cannot be found elsewhere in print. It also abounds throughout with facts and instructions rendered valuable by being clearly rendered together and in simple order. It contains 120 diagrams, illustrating machinery, etc., which alone are of the greatest value. PRICE, $7.50.

ROASTING OF GOLD AND SILVER ORES (Second Edition) and the Extraction of their Respective Metals without Quicksilver. 1880.

This rare book on the treatment of gold and silver ores without quicksilver, is liberally illustrated and crammed full of facts. It gives short and concise descriptions of various processes and apparatus employed in this country and in Europe, and the why and wherefore. It contains 156 pages, embracing illustrations of furnaces, supplements and working apparatus. It is a work of great merit, by an author whose reputation is unsurpassed in his specialty. PRICE, $3, coin, postage free.

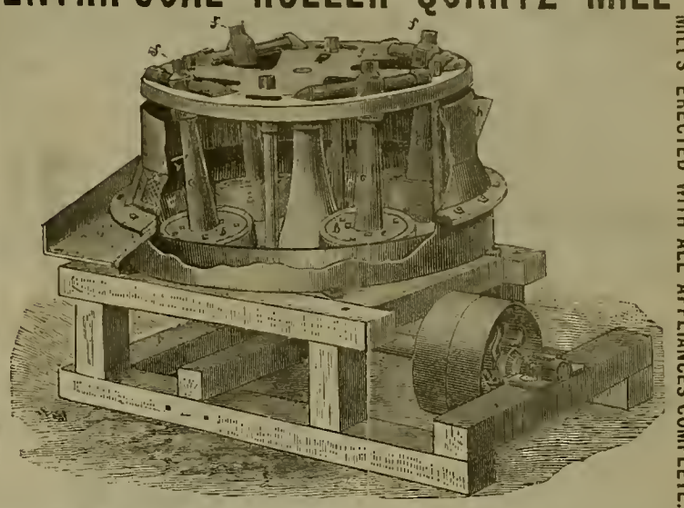
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CAPACITY AND DURABILITY GUARANTEED.



MILLS ERECTED WITH ALL APPLIANCES COMPLETE.

After running one of those mills on the Whiddon mine, in El Dorado county, over four months, and thoroughly testing its capacity and durability, I am prepared to offer it to the mining public, and claim for it the following advantages over the drop stamp mill:

1. The cost of same capacity is not more than one-half that of stamps.
2. Freight to mine one-fourth that of stamps.
3. Cost of erection at mine one-tenth that of stamps.
4. It runs with one-third the power per ton of ore crushed.
5. The wear is less than that of stamps.
6. The wearing parts are easily duplicated.
7. It has a much better discharge, and leaves the pulp in better condition for concentrating.
8. It is a better Amalgamator, saving fully nine-tenths of the gold in the mill; the balance can be saved on plates in the usual manner.
9. It is continually crushing; not like the stamp, using power to suspend it in air ninety-nine one-hundredths of the time, and the balance making a thundering noise, and accomplishing *comparatively* small results. It is as far in advance of the stamp mill as the present method of making flour with improved rolls is over the Indian's mode of crushing corn in a stone mortar.

PATTEN'S CONCENTRATOR.

This machine requires less power, less care or attention, and is less liable to get out of repair than any concentrator now in use. All of which any practical miner will comprehend when seeing it in operation.

The wear and tear is nominal, and the construction so simple that any miner can put it up and run it; and the low price brings it within the reach of all mill men, as it will save enough to pay for itself in any mill in a very short time. One machine will concentrate the tailings from a five-stamp battery.

SHINGLE MACHINES AND SAWMILL MACHINERY OF EVERY DESCRIPTION.

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Scientific Press



Patent Agency.

[ESTABLISHED 1860.]

Inventors on the Pacific Coast will find it greatly to their advantage to consult this old experienced, first-class Agency. We have able and trustworthy associates and Agents in Washington and the capital cities of the principal nations of the world. In connection with our editorial, scientific and Patent Law Library, and record of original cases in our office, we have other advantages far beyond those which can be offered home inventors by other Agencies. The information accumulated through long and careful practice before the Office, and the frequent examination of Patents already granted, for the purpose of determining the patentability of inventions brought before us, enables us often to give advice which will save inventors the expense of applying for Patents upon inventions which are not new. Circulars of advice sent free on receipt of postage. Address DEWEY & CO., Patent Agents, 252 Market St., S. F.

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The Company announce the completion of its line March 1, 1882, to CANDELARIA, Columbus Mining District, Esmeralda Co., Nev., 188 miles from Mound House (Junction with Virginia and Truckee Railroad).

STAGE CONNECTIONS,

At Hawthorne with U. S. Stage Company's daily coaches for Aurora (26 m.); Bodie (37 m.); Lundy and Bridgeport.

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To the above points for sale at San Francisco, Sacramento, Reno, Carson and Virginia R. R. Ticket offices.

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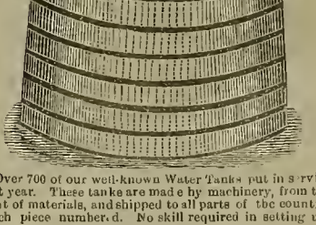
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Cheap Ore Pulverizer.

There is for sale in this city, by I. A. Heald, American Machine and Model Works, 111 and 113 First St., a Rutherford Pulverizer, an improved revolving barrel crusher, which was only used a few times and is as good as new. It will be sold very much below cost, and miners who are in need of such an appliance for a small mine will do well to make inquiries concerning it. It is suitable for a pulverizing mill for powder or other substances. Reference as to above can be had upon applying to this office.

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☞ References, Circulars and Samples sent on application.

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Flouring Mills, Saw Mills and Quartz Mills Machinery constructed, fitted up and repaired.
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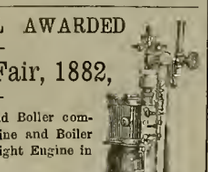
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All kinds of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, Sheathing Nails, Rudder Braces, Hinges, Ship and Steamboat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch. PRICES MODERATE.
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The Best Crusher in the Market and at the Lowest Prices. Power, Hydraulic Ram or Cylinder Elevators, Hand Power Hoists, for sidewalks any purpose, Saw Arbors and Mill Fittings. Repairing promptly attended to

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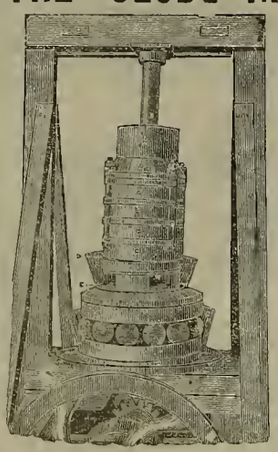
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Sole Manufacturers of Kendall's Patent Quartz Mills



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Sole Licensed Manufacturers of the
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For the States of California, Oregon and Nevada, and the Territories of Idaho, Washington, Montana, Wyoming, Utah and Arizona. Lightest, Strongest, Cheapest and Best Balanced Pulley in the World. Also Manufacturers of
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Builders of Steam Machinery
IN ALL ITS BRANCHES,
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HIGH PRESSURE OR COMPOUND.
STEAM VESSELS, of all kinds, built complete with Hulls of Wood, Iron or Composite.
ORDINARY ENGINES compounded when advisable.
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SUGAR MILLS AND SUGAR-MAKING MACHINERY made after the most approved plans Also, all Boiler Iron Work connected therewith.
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HYDRAULIC RIVETING. Boiler Work and Water Pipe made by this establishment, riveted by Hydraulic Riveting Machinery, that quality of work being far superior to hand work.
SHIP WORK. Ship and Steam Capstans, Steam Winches, Air and Circulating Pumps, made after the most approved plans.
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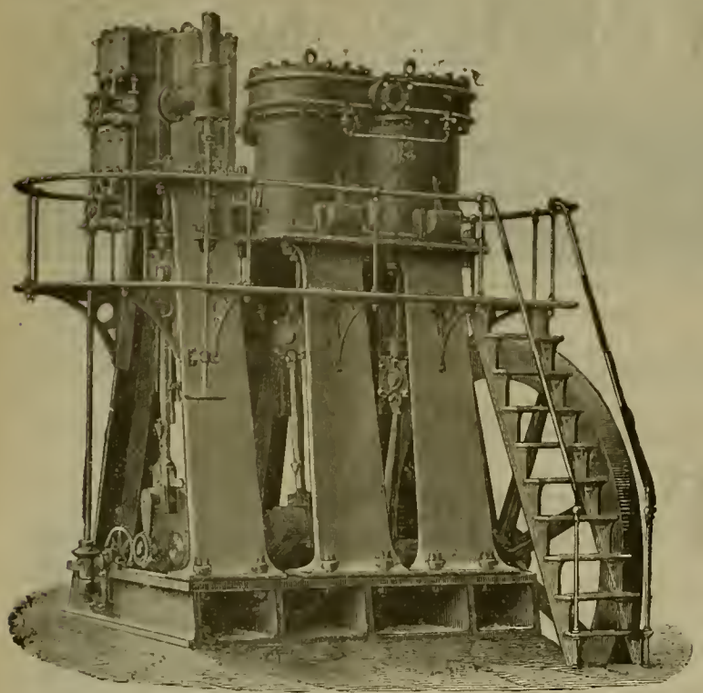
WATER JACKET SMELTING FURNACES
—FOR—
Galena Silver & Copper Ores.
The PACIFIC WATER JACKET SMELTERS embrace many features that are entirely new and of great practical utility, which are covered by letters patent.
No other furnaces can compare with these for durability and in capacity for uninterrupted work.
MORE THAN ONE HUNDRED of them are now running on the Pacific Coast, giving results never before obtained as regards continuous running, economy of fuel, grade and quality of bullion produced. We are prepared to demonstrate by facts the claims here made.
These Smelters are shipped in a complete state, requiring no brick or stone work, except that for the crucible, thus saving great expense and loss of time in construction.
Complete smelting plants made to order of any capacity and with all the improvements that experience has suggested as valuable in this class of machinery. Skilled and experienced smelters furnished when desired to superintend construction and running of furnaces. Estimates given upon application. Send for circular.
RANKIN, BRAYTON & CO.,
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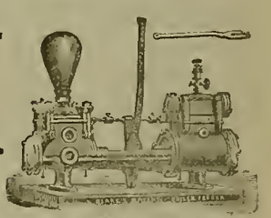


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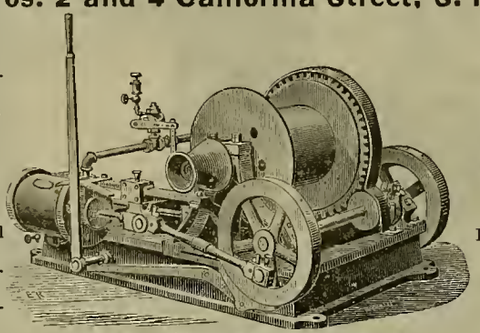


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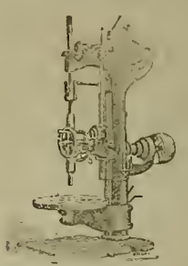




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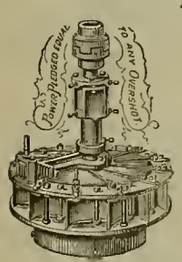
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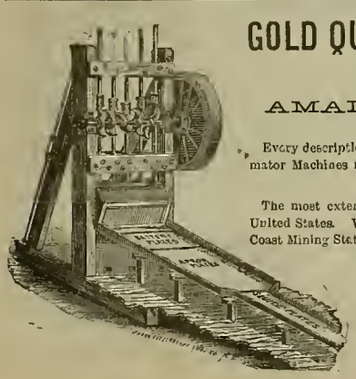
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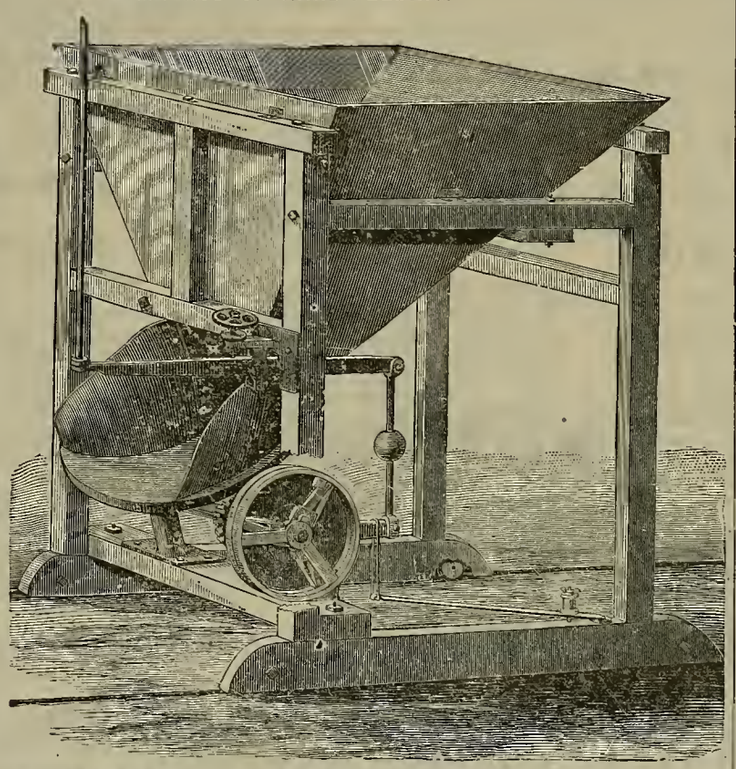
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Pacific	40	"	" " "
Nashville	20	"	El Dorado " "
Gross	80	"	" " "
Julian	20	"	Placer " "
St Patrick	15	"	" " "
Providence	40	"	Nevada " "
Empire	20	"	" " "
Idaho	30	"	" " "
Green Mountain	60	"	Plumas " "
Plumas-Eureka	60	"	" " "
Bulwer-Standard	30	"	Bodie, Mono, "
Standard	20	"	" " "
Noondaa	30	"	" " "
Big Dry Creek	10	"	Fresno " "
Mexican	44	"	Lyon county, Nevada.
Santiago	32	"	" " "
Vivian	16	"	" " "
Christy	5	"	Uintah, county, Utah.
Contention	20	"	Tombstone, Arizona.
Grand Central	20	"	" "
Sunshine	20	"	Black Hills, Dakota.
Homestake	200	"	" " "
Father de Smet	80	"	" " "
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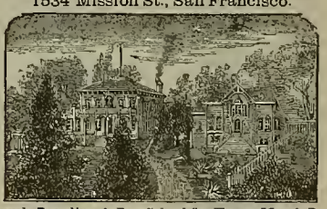
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SAN FRANCISCO, SATURDAY, OCTOBER 6, 1883.

VOLUME XLVII Number 14.

The Shelf Dry-Kiln.

The following paper was read by C. A. Stetefeldt, the inventor of the well known furnace, before the American Institute of Mining Engineers. The shelf dry kiln described has been patented by Mr. Stedefeldt:

In the dry-crushing of ores, either by stamps, rolls, or other machinery, it is essential that the material should be free from moisture. Hence a contrivance which effects this with economy, and is of durable and compact construction, is a great desideratum. It is claimed for the below-described shelf dry-kiln, that it possesses these qualifications in a high degree.

The construction of a shelf dry-kiln is based on the Hasenclever principle. That is to say, a number of inclined shelves are arranged zig-zag above each other in a vertical shaft, having openings or slits where they meet, on which the ore rests in a stratum, the thickness of which is governed by the width of the slits and the inclination of the shelves. If a portion of the charge is removed at the end of the bottom shelf, a sliding motion of the ore takes place on all shelves above, and the top shelf is replenished from a hopper set over it. It will be seen that the shaft is divided by the shelves into a number of triangular prismatic spaces. Through these the hot gases from a fireplace are made to circulate, each space communicating with the next one by a flue arranged in the side wall of the shaft. These flues being located on alternate sides of the shaft, a continuous passage is formed through the whole structure.

After thus stating the principle of the construction, its details will be easily understood by reference to the drawings, Fig. 1 to Fig. 5. The drawings, Fig. 1 to Fig. 4, represent two kilns united into one structure. The cast iron shelves (*a*) are 2 feet 4 inches wide and 5 feet long, with sides and a back 4 inches high, and are cast a full half inch thick. How they rest on the brackets (*d*), and interlock each other, is shown in Fig. 5. Three such shelves, with an inclination of 38 deg., are placed in one row in a brick shaft 7 feet and ½ inch wide and 4 feet deep. The ore hoppers (*g*) rest on the iron beams (*f*). At the end of the bottom shelves are the discharge doors (*b*), with chutes projecting beyond the front wall. A swinging apron (*c*) keeps the ore in place. By dropping it a car below the chute is filled with dry ore. A number of extra large pieces of ore may cause a stoppage in the slits; for such an emergency the openings (*e*) are provided, through which a poker can be inserted. The fireplace, with air channels (*h*), is located near the base of the kiln, but its hot gases enter below the top row of shelves, and move downward, finally escaping through the flue (*k*), which is connected with a chimney. Such an arrangement is made for very good reasons. If the fire entered below the bottom row of shelves, which are filled with dry and hot ore, a careless laborer might overheat and warp them by too heavy firing. As it is, the greatest heat strikes those shelves which are filled with cold and moist ore, and overheating can hardly occur. With a downward draught the temperature of the kiln is very uniform, and the evaporated moisture can not condense again by coming in contact with cold and wet ore. The opening (*i*) in the front wall is closed either by a brick wall or a sheet-iron door. The height of the kiln from the discharge floor to the top of the hoppers (*g*) is 21 feet, more or less, depending somewhat on the height of the car to be used for transporting the dry ore to the crushing machinery. The brickwork is heavily anchored with beams, rails, bolts and buck-straps, which are not shown in the drawings.

In constructing the kiln none of the shelves are put in position until the shaft is finished to the level of the beams (*f*), and the brickwork is fully anchored. In order to avoid difficulties in placing the shelves, it is best first to fit them, set after set, into an exact wooden model of the shaft (2 feet 4 inches wide), which is put up on the fireman's floor, not in a vertical, but in a horizontal position.

Since a good draught is essential for drying the ore quickly, the chimney should rise not less than 30 feet above the top of the kiln. For one double kiln a draught area of 3 square feet is required.

In case the kiln is used for drying salt, some remarks about its operation may not be out of place. The wet salt, on the top row of shelves, first bakes into a solid cake. By increasing the fire decrepitation of the salt-crystals commences, and the whole mass is shaken loose, with exception of a crust on the top. This is broken up by means of a light poker with chisel end. If the fire is kept right no rebaking of the salt takes place on the second row of shelves, but violent decrepitation continues here and lower down. The constant impact of the decrepitating salt-crystals has, in the long run, a destructive effect on the walls of the kiln if they are built of ordinary soft brick. Hence it is necessary to line the salt kiln with very hard-burnt common brick, or with fire brick. The drying of the salt is very perfect. Two double kilns for ore and one single kiln for salt have been in operation at the Lexington mill, Butte City, Montana Territory, since September 1, 1882. Mr. A. Wartenweiler, a member of the Institute, gives the following statistics as to the capacity and consumption of fuel and labor of this plant. The two double kilns put through 54 tons of ore, with about 4 per cent of moisture, and consume 2 cords of wood in twenty-four hours. In calculating the consumption of wood for several months it is found that .039 cords of wood are used for drying 1 ton of ore. One single kiln puts through 8 tons of salt (dry weight), with about 6 per cent of moisture, and consumes 1 cord of wood in twenty-four hours. In calculating the consumption of wood as above, it is found that .11 cords of wood are used for drying 1 ton of salt. The capacity of the salt kiln is somewhat overtaxed, and a heavy fire has to be kept. In consequence, the upper shelves, next to the fire, warp after some time.

One man in each shift attends to the fireplaces and the salt kiln, and one man in each shift discharges the dry ore and salt, and transports it to the self-feeders of the batteries. All shifts in the mill are eight-hour shifts.

The weight of the iron plant for one double kiln, consisting of castings, wrought-iron work, beams, rails, buck-straps and bolts, is about 25,000 pounds. The quantity of brick required is 30,000. It may be stated that every thing is constructed with a view to durability.

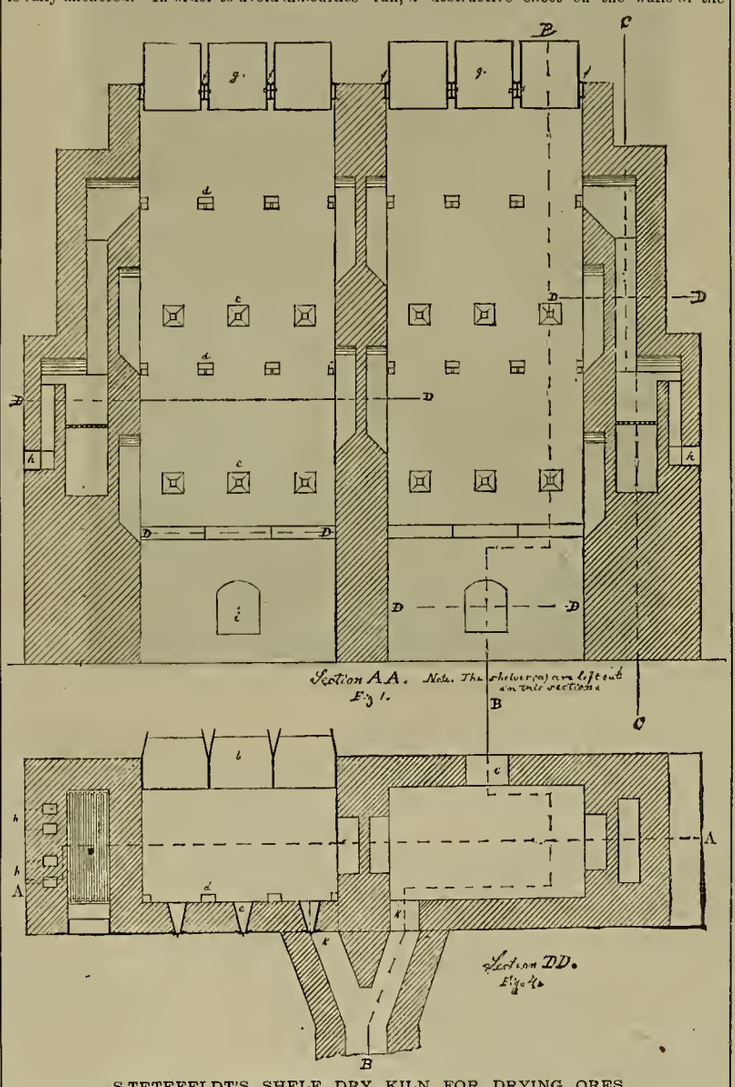
Compared with the revolving or cylindrical dry-kiln, the following advantages are claimed for the shelf dry-kiln:

1st. Greater compactness of construction, and greater durability.

2d. Greater economy in fuel, since very little heat is lost by radiation, and the heat is better utilized by traveling through a much longer space.

3d. No power is required in its operation.

4th. It produces no dust; hence no necessity of erecting dust-chambers, and no loss in precious metals from this source. (See illustrations on page 217.)



STETEFELDT'S SHELF DRY KILN FOR DRYING ORES.

Mill Sites.

The United States Mining laws provide that where non-mineral land not contiguous to a lode is used or occupied by the proprietor of the lode, it may be embraced in the application for the patent of the lode. The owner of a quartz mill or reduction works not owning a mine, can also patent a mill site. The rulings of the Land Office require that in making a survey in a case of this kind the course and distance from the corner of the mill site to the corner of the lode claim must be given in the field notes and plat, and a copy of the notice and plat must be posted on the mill site, and at the lode, also, for 60 days.

In case the owner of a quartz mill or reduction works is not the owner or claimant of a vein or lode, the law permits him to make application therefor in the same manner as that prescribed for mining claims; and after due notice and proceedings, in the absence of a valid adverse filing, to enter and receive the patent for the mill site at five dollars an acre.

In every case there must be a satisfactory proof that the land claimed as a mill site is not mineral in character, which proof may, when the matter is unquestioned, consist of the sworn statement of the claimant, supported by that of one or more disinterested persons, capable, from acquaintance with the land, to testify understandingly. The law expressly limits mill-site locations to five acres.

In Germany the effort to induce emigration to California has to be made in the face of government opposition. No pamphlets are allowed to be circulated, and a short time ago 20,000 books issued by the Central Pacific Railroad's agent were seized and destroyed.

CORRESPONDENCE.

Steel and Cast Steel.

EDITORS PRESS: — The difference between steel and cast steel, and the methods of making these metals, is a subject upon which there is much confusion of ideas in the popular mind, and even much ignorance displayed by dealers and workers of steel when called upon to define and explain it, and describe the various processes of manufacturing.

But steel may be defined as iron with a small amount of carbon; and common rail steel may differ but a little from iron. This class of steel is termed "low grade," "decarbonized" or "crude" steel, and the Bessemer steel furnishes a fair sample. It is well adapted for much mechanical work, including building material, shaftings and railroad rails. In ten years this class of steel has almost superseded iron for railroad rails; for in 1881 there were 3,485,000 tons of steel rails made against 700,000 tons of iron rails. At this rate of increase, in ten years more the iron rail will be but a memory. The methods, or processes, of making this crude, or low grade steel, are numerous, but as all bring about the same result, and differ only in details of manipulation and employment of means used, a description of the Bessemer process which serves as a general type and description of them all. Ore suitable to make iron, of a quality thought worthy to be converted into Bessemer steel, must be comparatively free from sulphur or phosphorus, and while common iron ore is quoted in Cincinnati, Ohio, at $4 per ton, "Bessemer ore" is quoted at $10.50 per ton. This selected ore is so mixed as to produce the best results and assist the "conversion," and is then smelted into iron by the ordinary furnaces; the molten iron is then run into a large pear-shaped vessel called a "converter," which is suspended on hollow trunnions, through which a blast of air is driven under heavy pressure for about twenty minutes. This blast of air rushing through the liquid metal burns out a portion of the sulphur and phosphorus as well as about ten per cent of its carbon. To replace this carbon "white iron," or speigeleisen is added. When the color of the flame, which rushes from the top of the "converter," shows that conversion is completed, the blast of air is shut off, and the "converter" is turned on its trunnions and its contents poured into iron molds and made into ingots to be reheated and hammered or rolled into bars, plates, railroad rails, etc.

Cast steel differs from this "crude," or "Bessemer" steel, in the materials used, in its manufacture, the methods employed, and the results reached. In fact, cast steel is the great cutting material, and instead of being made like the Bessemer from pig, or cast iron, it is made from the best quality of wrought iron, excepting the steel made from black sand, by the Russell process. The result is so different from the crude steel, that cast steel is used wherever lightness, elasticity and great strength is required, or a hard, fine, or cutting edge is wanted.

For the production of cast steel (with the exception of black sand) the material used is the best wrought, or Swedish iron; by far the largest amount is made from the "Danemore" iron. The ore from which this iron is made is magnetic, and remarkably free from sulphur, phosphorus, arsenic, manganese or other deleterious substances. It is smelted into pig or cast iron, and remelted, and run into ingots, reheated and rolled, usually for convenience sake into bars three inches wide, and five-eighths of an inch thick. These bars are next packed with charcoal in air tight chambers in a furnace, in such a way that no two bars touch, and a fire is kept up from nine to fourteen days, or until the tests made at certain intervals show that cementation has taken place, and the molecular structure of the metal has undergone a complete change. The bars are next removed, and as they are covered with blisters, the metal is now designated as "blister steel." These bars are now broken into small pieces, and put into black lead crucibles, and submitted to a great heat for about two and a half hours and melted. This liquid steel is now run into molds, or made into ingots of about fifty pounds weight, unless larger ingots or castings are required; if so, they are made from the resultant product of many crucibles. Herr Krupp sometimes uses the resultant of two thousand crucibles to cast one big gun.

The small ingots are sold in the market or sent to the steam hammer, or rolls, to put into merchantable shapes, in like manner as the Bessemer steel.

There is another process of making cast steel called the "Russell" process, which has been recently invented by Dr. E. F. Russell, of San Francisco, which is unique, and is the crowning discovery of the generation in the manufacture of high grade steel, as the steel is made direct from the ore at one heat.

A detailed description of this method, or process will be interesting, as it is especially adapted for utilizing the black magnetic iron sand that abounds in inexhaustible quantities, not only upon our present coast line, but along the old ocean beaches of past ages, which are now situated in many places far inland.

All the black sand deposits upon this coast contain gold, and in working it, an important rebate is furnished; for after the iron ore is separated from the lighter sand, the gold is easily extracted, and is found to vary in value from a few cent to a number of dollars per ton, and will probably average at least one dollar per ton above the expense of extracting it.

The mining of this ore consists in simply shoveling the sand into and running it through a "magnetic separator" which may have a capacity of 200 tons per day. The sand yields from fifty to ninety per cent of iron ore, and some of these machines will save within one or two per cent of all the magnetic ore it contains.

The ore is pure oxide and suboxide of iron, and contains no sulphur, phosphorus, arsenic or manganese. Assays of this ore give 72.4 per cent of metal, and daily smeltings by the Russell process have averaged 66⅔ per cent of steel from the gross weight of the ore. To work this fine ore successfully in a blast furnace, it is agglomerated with the fluxes, and made into small masses or "bricks," and these are cast into the furnace (as coarse ore or ingots of pig-iron) and smelted, and the first result is cast-steel of a high grade. This is run in molds, and when annealed, is passed to the steam-hammer or rolls, and adapted to the wants of the market.

To make crucible steel, the ore is simply mixed with the fluxes, in proportion of about four of ore to one of flux, and poured in crucibles of black lead and smelted. The result is steel; and ample tests prove it to be the equal of the best brand of steel made from the best brand of Swedish iron.

The practical work already done proves that this steel can be made as cheaply as wrought-iron, and it is capable of being made almost as soft as copper, and of taking temper until it rivals the hardness of diamonds, and takes a polish until it can be used as a mirror and looks like burnished silver. It cannot be presumptuous to prophesy that the Russell process will soon revolutionize the manufacture of high-grade cast steel, as the Bessemer has the manufacture of rails.

Bessemer has done much to advance civilization, by introducing cheap steel; and soon the world will give Russell a place beside him, and acknowledge him as another grand apostle of the Steel Age, or the age of advanced civilization.

E. T. BARBER.

Gunnison County (Colorado) Mines.

EDITORS PRESS: — Assuming that you are always willing to place reliable mining information of a general character before your readers, I write you after a ten day's trip to the mining towns in Gunnison county, Colorado. The first two days of my trip were spent at Crested Butte, a town of 1,300 inhabitants, situated in a valley thirty miles northwest of Gunnison town, and connected with it by a branch of the Denver & Rio Grande railway. The mining here consists in the development of both bituminous and anthracite coal, the Colorado Coal and Iron Co., of Denver, having very extensive bituminous coal beds and fifty coke beds, employing fifty men, under the superintendency of J. K. Robinson. At present this is by far the largest interest in the town, and the one upon which it is to a great extent depending. From one to five miles north of the town there are two anthracite coal mines that are now assuming sufficient proportions to give them considerable notoriety. The Mesa Mining Co., of which Mr. Howard F. Smith, of Crested Butte, is the manager, have expended a large sum of money in acquiring and developing coal lands, and in the erection of a coal breaker. Mr. Rush Warner, of Gunnison, the Manager of the coal company, is pushing the work of development gradually. The anthracite coal now being sold by these companies is considered equal to any in the market. From Crested Butte westerly about eight miles, is the

Mining Town of Irwin.

Of about eight hundred inhabitants. This is the seat of the Forest Queen mine which deservedly ranks among the first class mines of the county. The company which now control this mine are putting up large hoisting works, with the view to work the mine upon a much larger scale than heretofore. The Thompson Brothers, from whom the present company bought a controlling interest, are still connected with it, and immediately interested in the management. There are in and about Irwin, within a radius of three miles, several very promising mines in different stages of development; among which are the Durango, Bullion King, Ruby Chief, The Oaks, Old Sheik, Howard Extension, Hopewell and others, upon each of which from $2,000 to $30,000 have been expended, and with very satisfactory results. The ore in this camp is of a high grade, assaying from $50 to $2,000 in silver. The Rose Reed & Co.'s concentrating works are established here, and doing a steady and paying business; and McVictor Wilder is erecting concentrating works with a capacity of twenty tons daily. This, when completed and running, as it will be in a few weeks, together with the concentrators already mentioned, will greatly facilitate and encourage mining operations in Irwin,



PLAN OF FIRST STORY OF DR. CARR'S RESIDENCE See Page 214.

as the transportation charges will be materially lessened. There is an apparent dullness in the town at present, though sufficient development has already been made to convince the most skeptical that with continued development, and properly expended capital, Irwin will eventually have an output equal to any camp in the State, except Leadville. Returning to Crested Butte from Irwin, I then pushed my way through to Gothic, a mining town of considerable importance, though very dull at the present time. The most noted of

The Gothic Mines

Are the Sylvanite, which has produced large quantities of very high grade silver ores. One piece of 670 pounds was sent to Chicago for reduction, and contained sixty per cent silver. This mine is owned by Chicago and Philadelphia capitalists, and is considered and known to be one of the best properties in the county, the regret being that it is not pushed for what it is worth.

The Virginia

Owned by C. O. and T. M. Avery, of Chicago has produced large quantities of high-grade ore and its development consists of a shaft of 210 feet, and tunneling and drifts to the extent of 300 feet. The ore is gray copper and brittle silver.

The "James B. Belford," owned by Birge and Wait, is now being developed, and is producing some very fine ore of yellow and gray copper. This is looked upon as one of the most promising of the Gothic mines. In addition to those named, there are dozens of others which are gradually being developed, as the circumstances of the owners will admit of. Among them, the "Iron Duke," "Silver Nicholas," "Jenny Lind," "Jim Blaine," "Rustler," "Silver Ledge," "Midnight," and many others. The owners of the mines in this neighborhood are generally men of small means, and it often occurs that their means are expended just at a time when a little additional capital would develop, in a good many instances, good properties. In fact, at the present time, in all parts of the county, the cry of the prospector and miner is for more capital, and if I may be permitted to judge of the present condition of prospects, mines and miners, I would most unhesitatingly say that there has never been a time in this county when good mining properties could be secured at as low figures as at present. It is conceded on all hands that no one is now capable of selling "holes" in the ground at fancy figures, as was the case in the days of Leadville excitements, and that it is better to sell at low or fair prices than not to sell at all. With a desire to sell at what mines are really worth, based to some extent on commercial principles, I trust that ere long the mining interests of this county will revive.

Yours, etc., MONTAGUE.

Soda Deposits.

They are Beginning to be Looked After in Nevada.

Since it has been fully demonstrated that borax, especially the cotton-ball form, cannot be successfully worked without the use of carbonate of soda, says the Candelaria *True Fissure*, considerable attention has been given to the search for deposits of it. A large and valuable piece of ground containing a very large percentage of soda was discovered some years ago at or near the upper end of Walker lake. This is under the control of B. F. Gray, who will soon erect drying sheds and put other necessary machinery at the place of the deposit. He estimates that he has one of the best soda marshes to be found anywhere on the coast. He also contemplates the manufacture of potash, which commodity is largely in demand in San Francisco and other manufacturing towns. An experiment is now being tried by Jas. Cross to ascertain the value of soda contained in the waters of Black lake, situated about three miles west of Benton, California. The water is usually impregnated with alkali. The lake is situated in a basin formed by the surrounding hills, being fed by springs on the hillsides, and by several in the lake itself. The atmosphere near the water is very disagreeable in odor, and at the lower, or southern end, almost intolerable. About 200 acres of the land about the lake, which is one and one-quarter miles long by an average width of about a third of a mile, has been surveyed and located for soda. A number of pits are being dug near the edge of the water, into which some of the alkaline fluid will be run, and then allowed to evaporate. This will give a fair but crude test of the amount of soda in the water. If the experiment proves good, a ditch will be dug and a concrete pipe laid to the railroad station, a distance of five or six miles, through which the water will be conveyed, and the evaporation will then be done near the shipping point, thereby saving hauling. One curious feature of the water is that in several places it is of a color almost as red as blood. This may be due to some mineral, but it is more generally thought the presence of animiculæ causes the discoloration. Within a short time enough will be known of the value of the discovery, and if it proves successful, there is a lot of money in it for the holder.

The Ragtown Soda Lake.

If soda is now an object, as explained above, the soda lake near Ragtown should come to the front. There pure crystallized soda may be cut in great squares, looking for all the world like rose-colored ice. Some years ago sheets of this soda three feet square, three or four inches thick and showing beautiful crystals on one side were brought to this city. The parties who then claimed the lake and surrounding deposits asserted that they had an inexhaustible supply. By digging down through a foot or two of gray mud they came upon a solid bed of of soda unknown depth. When saturated with water, as it is when first dug up, this soda presents the appearance of ice. The finding of soda in this shape by the pioneers who crossed the plains in the early days of the California gold excitement gave rise to the story—firmly believed for many years among the miners—that in places on the deserts there was everlasting ice under the alkali sands. The theory was that the white sand and chalky alkali dust reflected all the heat of the sun and preserved the ice beneath year in and year out.

As the Ragtown deposit is at no great distance from the Carson and Colorado Railroad, over which it can be cheaply shipped, it may now be well worth looking after. There is nothing to do but quarry out blocks of the pure soda and pile them up on edge till they drain out and dry off. They are then ready to ship.—*Virginia Enterprise.*

A FAST BOAT.—the celebrated Hudson river steamer, *Mary Powell*, regularly makes twenty-two miles an hour on an ebb tide. She is by far the fastest boat on the Hudson, and can slide right away from Gould's $250,000 steam yacht, *Atlanta.*

A STATE Court of Louisiana has ordered the mail matter intended for the Louisiana Lottery Company and addressed to the New Orleans National Bank, to be delivered to the Bank. The case will be removed to a Federal Court.

By the aid of the American idea of using refrigerator cars, Londoners now enjoy fresh herring from Scotland.

MECHANICAL PROGRESS.

Increased Speed of Machinery.

The precise economical speed at which machinery of various kinds may be run is a matter of great importance. Very much in this direction depends upon the degree of perfection which has been obtained in its manufacture. Much attention is being directed to this subject at the present time, and careful inquiries appear to show a gradual increase in speed within the last fifteen years. Inquiries in this direction in the Lowell Cotton Mills indicate an increase of from 25 to 30 per cent within the period mentioned. In considering the condition of various manufacturing interests this matter of higher speed and increased capacity of machinery is, says the New York *Commercial Bulletin*, often lost sight of, but is certainly worthy of attention. There are about 12,000,000 cotton spindles in the United States to-day, against 7,000,000 in 1870; but if the speed and capacity per spindle has increased even 25 per cent, the actual productive capacity of the mills has been more than doubled, and the cotton manufacturing capacity of the United States been more than doubled since 1870; and a glance at the amount of cotton actually consumed by our mills shows an almost equal increase.

In the woolen manufacturing interest very similar conditions are found to exist. A desire to diminish the cost of production has led to an increase in the speed of machinery, and an increase of the capacity of the mills in other directions. The loom which formerly ran 50 or 60 picks per minute now runs 95, perhaps; and where 40 inch cards were used, many mills now have cards 60 inches in width and of proportionately increased diameters. And yet, in speaking of the number of sets of woolen machinery in the United States, we are accustomed to compare the figures of 1883 with those of 1873 or 1863, without paying attention to any increase which has occurred in the size of the cards or capacity of the machinery during this period.

The effect of lessening cost of production by means of increased speed and machinery of enhanced capacity is good. It is in the interest of the consumers, and therefore eminently economical in its tendency.

The Bisulphide of Carbon Boom

Every two or three years some one comes out with an alleged new discovery in the way of substituting bisulphide of carbon vapor for steam as a motive power. *Cotton, Wool and Iron*, of Boston, speaks as follows of the latest claim in this direction: "It may interest our readers to know that very extensive and expensive, as well as decidedly unsuccessful, experiments were made at length, and we think some of them were made in the yard of the Corliss steam engine company, in Providence, upon this very peculiar vapor. Bisulphide of carbon is simply a combination of carbon and sulphur, and it has been used, to a certain extent, for heating and driving in the place of steam. It boils at a low temperature—something less than 120—and the general claim for it has been that its expansive force was so many times that of water, its boiling limit was so much lower than water, that if it could be controlled there was a tremendous force in it for practical utility that must ultimately and largely supplant steam power. Experience does not prove this to be all realizable. There is no doubt, perhaps, but that it may be somewhat more profitable in certain localities, and with the peculiar apparatus required, than steam power, but the question as to whether it will in any sense supplant steam where large powers or an aggregation of power, are required, is quite another matter; it is something which has never yet been done successfully. It will be best to carefully examine and wait. If it is to be profitable, then come in on the homestretch, but if you invest on the supposition that you are going to destroy steam power, follow the old man's advice about speculating in stocks, which, being condensed, is simply this: Make out a check for the largest amount of money you can lose, go and give it to some stock broker and tell him, under pain of death, never to come near you or speak to you again. This is the cheapest way to get rid of your money."

An Improved Wood Pulp Machine.

A Gardiner, Maine, man has invented a machine for preparing wood fiber for paper pulp, which is described as follows: The purpose of the machine is to shave the wood off so finely that it is ready to go into the paper engine. It takes a piece of log, 12 inches in length, which is revolved at a speed of 1,000 revolutions per minute. A sharp cutter shaves off a shaving so thin that it would take 750 of them to make an inch. As it takes 200 sheets of ordinary paper to make an inch, one can judge somewhat of the thickness of fiber made by this machine. The knife has a sliding motion, and gradually moves forward as the block decreases in diameter. In the first machine made, the principal trouble was found in keeping the knife sharp. As the knife became dull, the fiber turned off became of uneven thickness, but this has been remedied by an ingenious arrangement of whetstones that keep constantly at work on the knife while the machine is at work. The pulp the machine makes has not been tried on the better class of paper, but it will work on the coarser grades, and the inventor is confident it will result in a great change in the manufacture of pulp. It makes it much faster, besides saving labor, and the saving in cost of transportation, the pulp being dry and therefore with no water to pay freight on, will be a good profit.

Economy of Steam.

A correspondent of the *Scientific American* calls attention to a source of the loss of steam to which very little attention has heretofore been paid. His suggestions, which are appended, are well worthy of consideration:

Whenever and wherever a steam engine is at work, it must be kept at its full working head of steam nearly up to the very close of its service. Just before a steamer reaches her wharf, or before the six o'clock bell is about to ring for the shutting down of mill or factory work, if the engineer has a surplus of power, he can afford to bank his fires, and economize a trifle by working down a few pounds of his extra steam. But it is only a very little, for he must of course retain enough to drive the engine at its working gait fully up to the last minute. And when the bell rings and he shuts off steam for the end of the trip or the close of the day's work, his gauge shows a pressure but a few pounds below that at which he regularly runs. His boiler therefore is now a reservoir of power which is practically to be wasted. He either "blows off steam," or he does not, according to circumstances, but in either event the greater proportion of that power is lost for service. The dissipation of heat which necessarily takes place before the hour comes for starting again measures precisely the amount of energy wasted, for the vapor of water owes its efficacy only to the heat of recent importation. Without the heat its elasticity is gone. Can we not possibly substitute for it a gas whose elasticity does not depend on recent heat, but is a permanent quality at all temperatures, notwithstanding the fact that an increase of temperature gives an augmented elastic force?

Compressed air furnishes us exactly what we need to answer our purpose. Were the force of the steam used mediately, through an air tank, and not directly, it would be an extremely simple matter to utilize the heat remaining in the boiler, furnaces, etc., so that scarcely any portion of it should be wasted. One turn of a switch would connect the steam power at once with pumps which would go on for ciugair into the air tank so long as any power remained. No attention would be needed. When the power was expended the engine would stop moving, and all would remain quiet till required for use. The air thus condensed would be a given amount of active energy ready for application on eall, and the efficient service of the engine for the next day would have just that amount furnished to its credit, with no expense added; that degree of expense would be saved. How much this would actually economize must depend on the circumstances, but it would in any case be no insignificant item. Inquiries made of steamboat engineers show that in their judgment it would be sufficient to run the boat from five miles to ten, according to her size and speed. Some go much higher than that. And with a large ocean steamer there can be scarcely a doubt that it would decidedly exceed this. Surely this is a wasted power, which is worth saving.

A NEW STYLE OF ROOFING.—We recently saw, says *Mechanics*, a slate roof, which, in its way, was a decided novelty. Each slate exposed its full face to the weather on a flat roof having a pitch of only one half inch to the foot. It was laid in cement, and had been on for five or six years. The cement was the invention of Mr. C. C. Post, of Burlington, Vt. It consists of coal tar (the liquid and not the solid article), thickened with cement, or, better still, a little ground slate, slaked lime and linseed oil. The proportions were made according to the judgment and the requirements of the material. It was heated until liquid, poured on the roof, and the slate bedded in it. The joints were then payed, and the roof was finished. The main bulk of the compound is tar and cement, or tar and ground slate. When of just the right thickness, the compound sticks with extreme tenacity to the slate, and cannot be detached without violence. The cost of such a roof is, we believe, at the present time, less than that of tin, and on account of the greater surface exposed to the weather, is considerably cheaper than slate. The compound is not patented, we believe.

ATTENTION has recently again been drawn to M. M. Neugean and Delaite's process of protecting iron surfaces against rust. A very fine powder of metallic zinc is mixed with oil and a siccative, and applied to the iron by means of an ordinary brush. In many cases one coat is sufficient. Two coats are, at any rate, guaranteed to secure a protection against the corrosive action of the atmosphere, as well as of sea water. The zinc coating gives the iron a steel gray appearance, and it does not interfere with subsequent painting. A good mixture, of which only the necessary quantity should be prepared, consists of eight parts, by weight, of zinc, seventy-one of oil, and two of a siccative. *Engineering*.

SCIENTIFIC PROGRESS.

Artificial Organic Compounds

It is but a few years ago that it was the universal belief that the synthesis of organic substances—that is, their direct production in the laboratory by the union of their elements or constituents, was an impossibility. It was believed that the substances peculiar to the animal and vegetable kingdom, many of them exceedingly complex, were elaborated in the living tissues under the agency of a peculiar force, in some respects independent of the physical and chemical forces, and which was characterized as the vital force. This view is now known to have been erroneous, and to-day an innumerable number of compounds peculiar to the animal and vegetable kingdom are produced in the laboratory of the chemist, and, in a number of remarkable cases, produced on the manufacturing scale.

The great discovery of Wohler—namely, the artificial production of urea from cyanate of ammonia, was justly looked upon at the time as being revolutionary, as it gave the death-blow to the usually received opinion that organic substances required the co-operation of a vital force for their production. And once freed from the incubus of this false assumption, a host of remarkable discoveries and investigations in this field have rewarded the labors of chemists.

In 1856, the French chemist, Berthelot, succeeded in effecting the synthesis of formic acid from inorganic materials—that is, from carbonic oxide and water, by heating with caustic potassa, and without the intervention of an organic substance derived from the living world. Close upon this came the synthesis of alcohol, directly from its elements—carbon, hydrogen and oxygen.

The result has been of vast service to the world in many ways, as a few striking examples will serve to show. About the year 1868, two German chemists, Graebe and Liebermann, succeeded in obtaining from anthraeene, one of the products of coal tar, a substance in all respects identical with alizarine, the coloring principle of the madder root. At first the discovery was looked upon as an interesting one, but of no industrial value. By the further development of their discovery, however, these investigators were enabled shortly thereafter to produce this important coloring principle in quantity on the commercial scale, at a price which enabled it to compete with the natural product. It was found not only to be in every respect capable of replacing the natural coloring principle, but to be superior to it, inasmuch as it was free from certain other related coloring matters that accompany the natural alizarine and detracted from the brightness of its colors. The result to-day of this interesting discovery, made a little over ten years ago, is the almost total extinction of the madder cultivation in Europe. Artificial alizarine made from anthraeene has taken the place of the natural product. Large areas of country devoted to the cultivation of the madder are now devoted to the raising of other crops, and the world's supply of a valuable dyestuff is obtained principally from the once worse than useless coal tar. In the course of a few years more, the inevitable result must be the total extinction of the madder cultivation.

Another example almost as striking is the artificial production of vanilline, the essential principle of the vanilla, which is now manufactured commercially on the larger scale, and threatens, by reason of its superior purity and relative cheapness, to completely drive out of the market the natural product.

The latest triumph of synthetical chemistry in this interesting field is the production of indigo by artificial means, which has lately been accomplished by Baeyer. The cost of producing this artificial coloring material is at present too high to seriously interfere with the natural dyestuff, but in a few years more, with the aid of study and experiment, the cost of its production will unquestionably be so greatly reduced that it will be placed in the market in direct competition with the natural indigo, which in time it will entirely replace.

The above are only a few of the more prominent examples of many that might be named, to show how steadily the chemist in the laboratory is encroaching upon the domain of nature. —*Manufacturer and Builder*.

The Alleged Luminosity of Magnets.

The late Baron von Reichenbach, in a remarkable work entitled the "Dynamics of Magnetism," described at great length a series of experiments with certain persons of peculiar nervous organization, which proved, as he claimed, that there is a peculiar luminous emanation arising from the poles of a magnet, resembling a faint electric discharge in rarefied air.

In the *Philosophical Magazine* for April last there is an account of a series of experiments made by a committee appointed by the Society for Physical Research, with the view of proving or disproving the existence of this alleged phenomenon. This committee has just reported through Prof. W. F. Barrett. From the report in question, it appears that neither Prof. Barrett nor any other member of the committee was able to perceive the emanation in question; but they succeeded in discovering two persons, one described as "a certain gentleman," and the other—a boy—"as an assistant in a baker's shop," both of whom appeared to be able, in a room perfectly dark to other people, to see a faint glow, like a waiving cone of light, at both poles of a strong electro-magnet, and to be able to distinguish, by the appearance and disappearance of this glow, when the current was turned on or off with the aid of a commutator in charge of a party in an adjoining room. From the account of the manner of conducting these experiments, it would appear that the committee had taken every reasonable precaution to guard against deception.

There is nothing absurd or impossible in the phenomenon alleged to have been discovered by Reichenbach; that which has always caused it to be looked upon with suspicion by scientific men, is the fact that it can only be observed by a limited number of persons whom Reichenbach calls "sensitives." It would appear to be a comparatively easy task to subject this as yet questionable phenomenon to such a rigorous examination as to place its existence or non-existence absolutely beyond further question. The experiments of Prof. Barrett's committee do not seem to have been extended enough to satisfactorily settle this question.—*Manufacturer and Builder*.

Return of the Great Comet of 1812.

The discovery of another comet, by Prof. Brooks, of the Rochester Observatory, N. Y., was recently announced. Careful observation has since shown that this is the famous comet of 1812, whose return was predicted for this year by the astronomers of 1812. The comet of that year was visible to the naked eye for the period of ten weeks. It is now again rapidly approaching both the sun and the earth, and will be visible to the naked eye in a few weeks. The comet has been observed by Mr. Hill at the Davidson Observatory, in this city. It presents a faint nebulous mass with a star-like nucleus of the eleventh magnitude. Its appearance is very faint, so much so that a star of the eleventh magnitude near by presented a comparatively dazzling appearance.

A few evenings after the discovery of this comet by Prof. Brooks, Prof. Swift, of the same observatory, and director thereof, discovered another comet in the same neighborhood. The indications are that these two comets will cross each other's orbits in their progress toward the sun. Their appearance so near together in the same field is considered as something surprising and significant. It is thought by some that they may throw new light upon the origin of comets and the laws by which they are governed. Both comets are being observed with much interest at all the American observatories.

AN alleged error in the accepted law respecting the intensity of sound as affected by distance, has lately been urged by Vierordt, who argues, as the result of many experiments, that the accepted law, that the intensity of sound "diminishes inversely as the square of the distance," should be modified to conform to the statement that "the intensity of sound in free air decreases in the simple ratio of the distances from the source of sound." According to the accepted law on this subject, when the distance from the source of a sound is doubled, the intensity should be reduced to one-fourth; when the distance is trebled, to one-ninth, etc. Herr Vierordt's observations led him to the conclusion that the intensity of sound, at double, treble, etc., the distance from the source of sound, is one-half, one-third, etc. Vierordt's experiments were made with a sound pendulum, which set in vibration a small ivory plate, and the observations were made at all times, under varying circumstances, and with different media—wood, metals, ice, water, etc. The results obtained are asserted to have been in all cases uniform. The law of "inverse squares" has long been held to be demonstrably correct as regards all radiant forces, and the experimental results of Vierordt will doubtless be found to be susceptible of some explanation which will bring them into conformity with the accepted view.

LIMITS OF GERMINATION.—Pasteur, in his investigations regarding fermentating germs and bactria, demonstrated that a temperature of 212° Fahr. was sufficient to destroy the power of germination in these minute forms of animal and vegetable life; but with the higher orders of plant and animal life, a much lower heat than 212° will destroy all vitality. According to Goppert, 39° F. is the lowest temperature at which most seeds would germinate. The following table by Sach shows the lowest, the highest, and most favorable temperature for germination of wheat, corn and barley:

	Lowest Temp.	Highest Temp.	Temperature of rapid Germination.
Wheat	41° F.	104° F.	84° F.
Corn	41°	104°	84°
Barley	48°	113°	93°

Experiments by the writer to verify the germinating point for wheat, revealed the fact that the temperature given is too low; as, in one instance, wheat that had been heated to 130° F. germinated. The grains were sprouted on cotton in the open air, and not in the laboratory by artificial heat, and the July sun and different wheat may explain this difference in results. The time required for germination varies—with wheat, rye, corn and oats three to six days being sufficient.

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ASSESSMENTS.

COMPANY	LOCATION.	NO.	AMT. LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alaska M Co	California	3	1.00	Aug 22	Sept 24	Oct 13	A Judson	320 Sansome st
Bodie Con M Co	California	3	50	Aug 4	Sept 10	Oct 10	G W Sessons	309 Montgomery st
Best & Belcher M Co	Nevada	27	50	Sept 18	Oct 24	Nov 16	William Willis	309 Montgomery st
California M Co	Nevada	9	20	Oct 1	Nov 7	Dec 5	C P Gordon	309 California st
Con Amador M Co	Nevada	6	50	Sept 15	Oct 20	Nov 13	F B Latham	408 California st
Campo Seco Copper Co	California	2	10	Aug 10	Oct 1	Nov 20	D Buck	309 Montgomery st
Chollar M Co	Nevada	12	1.00	Aug 2	Sept 6	Sept 28	W E Dean	309 Montgomery st
Day S M Co	Nevada	13	30	Sept 7	Oct 15	Nov 12	E M Hall	327 Pine st
Double Standard M Co	California	6	10	Aug 30	Oct 5	Oct 25	G W Sessions	309 Montgomery st
Eureka Con M Co	Nevada	7	10	Sept 27	Nov 10	Nov 30	A F Main	418 Jackson st
East Mt Diablo M Co	Nevada	3	05	Aug 13	Sept 17	Oct 8	G W Fisher	306 Pine st
Fisstracht Gravel M Co	California	13	05	Sept 11	Oct 17	Nov 5	H Kunz	209 Sansome st
Eureka Con M Co	Nevada	6	1.00	Sept 23	Oct 22	Nov 12	P Jacobus	309 Montgomery st
Gorilla M & M Co	California	2	21	Aug 23	Oct 3	Oct 31	A A Englist	436 Montgomery st
Hale & Norcross M Co	Nevada	78	50	Sept 11	Oct 16	Nov 6	J T Lightner	309 Montgomery st
Martin White M Co	Nevada	16	25	Sept 22	Nov 7	Dec 6	J Scoville	309 Montgomery st
McClinton M Co	California	9	05	Aug 30	Oct 4	Oct 24	G W Sessions	309 Montgomery st
Mexican M Co	Nevada	24	1.00	Sept 17	Oct 23	Nov 15	C L McCoy	309 Montgomery st
Pleasant Valley M Co	California	2	15	Sept 8	Oct 16	Nov 3	C E Elliott	327 Pine st
Potosi M Co	Nevada	13	50	Aug 13	Sept 17	Oct 8	W E Dean	309 Montgomery st
Ruby Hill Gravel M Co	California	9	25	Sept 3	Oct 20	Nov 12	H Pecham	320 Sansome st
Silver Hill M Co	Nevada	19	05	Sept 3	Oct 8	Oct 30	W E Dean	309 Montgomery st
San Miguel & Trinidad M Co	Mexico	3	1.00	Sept 8	Oct 11	Oct 19	C G Brooks	210 Front st
Trinity G M Co	California	1		Sept 15	Oct 22	Nov 6	L Wadham	528 California st
Tip Top M Co	Arizona	7	25	Aug 16	Sept 24	Oct 22	H Deas	309 Montgomery st
Winthrop M Co	California	1	25	Sept 17	Oct 23	Nov 16	H Wright	410 Front st
Yaqui M Co	Mexico	2	10	Sept 12	Oct 17	Nov 7	T T Atkinson	337 Pine st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Eureka Con M Co	Nevada	P Jacobus	309 Montgomery st	Annual	Oct 15
Exchequer M Co	Nevada	C E Elliott	327 Pine st	Annual	Oct 15
Gen Lee M Co		C E Gillett	334 California st	Annual	Oct 15
Linn Con M Co	California	C T Johns	309 Montgomery st	Annual	Oct 25
Peabody M Co	Nevada	R D Hopkins	436 Montgomery st	Annual	Oct 12
Syndicate M Co	California	J Stadtfeld	419 California st	Annual	Oct 18
Silver West Con M Co	California	F R Bunker	424 Montgomery st	Annual	Oct 12
Virginia Con M Co	Nevada	A F Benard	564 Howard st	Special	Oct 13

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Bulwer Con M Co	California	W Willis	309 Montgomery st	15	July 2
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	July 19
Mt Diablo M Co	Nevada	R W Heath	318 Pine st	25	Sept 25
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	Oct 12
Silver King M Co	Arizona	J Nash	315 California st	25	July 12

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Sept 12.		WEEK ENDING Sept 19.		WEEK ENDING Sept. 26.		WEEK ENDING Oct. 3.	
Alpha	2.00	2.15	2.10	2.55	2.00	2.30	....	2.25
Alta	.85	1.50	1.00	1.50	1.60	1.60	1.25	1.60
Andes	.70	.75	.60	.70	.50	.70	.50	.55
Albion	....	.40	....	.45	....	.45	....	....
Argenta	....	.15	....	....	....	....	....	....
Atlas	....	....	....	....	....	....	....	....
Belcher	1.00	1.10	1.05	1.15	1.00	1.05	1.05	1.10
Belding	....	....	....	....	....	....	....	....
Best & Belcher	3.75	3.20	3.35	3.75	3.20	3.60	3.05	3.20
Bullion	.90	1.00	1.00	1.05	....	.85	.75	.80
Bechtel	....	....	....	....	....	....	....	....
Belle Isle	....	.35	....	.30	....	.30	....	.30
Bodie Con	.15	.55	.65	.95	.55	.60	.50	.60
Benton	.20	.30	.20	.25	.25	.30	.20	.25
Bodie Tunnel	....	....	....	....	....	....	....	....
Caledonia	....	....	.20	.25	....	.25	....	....
California	.20	.30	.10	.20	....	.15	.10	.15
Challenge	....	.35	.40	....	....	....	.10	.15
Chollar	2.00	3.10	2.75	3.15	2.70	3.05	2.25	2.80
Confidence	1.90	2.00	....	1.85	1.60	1.80	....	1.60
Con. Imperial	....	.10	....	....	....	....	....	....
Con. Virginia	.55	.60	.45	.55	.45	.55	.40	.45
Crown Point	1.10	1.20	1.20	1.40	1.10	1.20	1.10	1.30
Day	....	.50	....	....	....	....	....	.20
Elko Con	....	....	....	....	....	....	.10	.15
Eureka Con	6¼	7¼	6.00	7.00	....	5.75	6.25	7.00
Eureka Tunnel	....	....	....	.15	....	....	....	.10
Exchequer	.55	.65	.60	.65	.55	.65	.50	.60
Grand Prize	....	.20	....	.10	.15	.20	....	.20
Gould & Curry	2.40	3.05	2.30	2.75	2.20	2.60	2.25	2.35
Hale & Norcross	3.70	4.95	3.70	4.10	3.55	4.10	3.25	3.70
Hohuss	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	....	.10	....	....	....	....	....	....
Justice	.35	.65	.40	.50	.40	.55	.40	.55
Jackson	....	....	....	....	....	....	....	....
Kentuck	....	....	....	....	....	....	....	....
Martin White	....	....	....	....	....	.10	....	....
Mono	....	....	....	....	....	....	....	....
Mexican	3.45	3.50	2.50	3.20	2.25	2.75	2.15	2.35
Mt Diablo	3.25	4.50	4.00	4.60	4.25	4.75	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	....	....	....	....	....	....	....	....
Northern Belle	6.00	6 75	6.00	.61	....	6.00	5.75	5½
North Noonday	....	....	....	....	....	....	....	....
Navajo	2.80	2.90	....	2.80	....	.60	....	2.60
North Belle Isle	.55	.60	....	.45	....	.45	....	....
Occidental	....	1.50	....	1.50	....	....	....	....
Ophir	3.45	3.70	3.30	3.70	3.25	3.70	3.25	3.45
Overman	....	.35	.40	.45	....	.40	....	.35
Oro	....	....	....	....	....	....	....	....
Potosi	.75	.90	1.05	1.20	1.00	1.15	.85	1.05
Pinal Con	....	....	....	....	....	....	....	....
Savage	1.85	2.20	1.75	2.05	1.65	2.00	1.40	1.70
Seg. Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	3.10	3.95	3.50	4.15	3.60	4.35	3.40	3.70
Silver Hill	....	....	....	....	....	....	....	....
Silver King	....	8.00	7.75	8.00	....	7.50	....	7.25
Scorpion	.55	.60	.60	.65	.60	.65	.50	.60
Tuscarora	....	....	....	....	....	....	....	....
Union Con	4.85	5.15	4.35	4.90	4.25	5.85	3.80	4.40
Utah	2.60	3.00	1.95	2.65	1.70	2.30	1.80	2.00
Ward	....	....	....	....	....	....	....	....
Wales	....	....	....	....	....	....	....	....
Yellow Jacket	3.15	3.35	3.10	3.30	3.05	3.25	3.05	3.20

Sales at San Francisco Stock Exchange

THURSD. V A M., Oct. 4

250	Alta	1.35@1.40	
100	Alpha	2.20	
500	Bodie Con	55c	
200	Belcher	1.10	
100	Chollar	2.85@2.70	
300	Con. Virginia	50c	
40	California	15c	
185	Crown Point	1.25	
100	Confidence	1.75@1.80	
10	Eureka Con	62	
300	Exchequer	65c	
700	Elko Con	10c	
20	Gould & Curry	2.45	
350	Hale & Nor	3.80	
200	Justice	45c	
540	Mexican	2.45@2.50	
25	Mt. Diablo	4.20	
100	Navajo	2.65	
30	N. Belle Is	40c	
150	Ophir	3.70	
210	Potosi	1	
700	Savage	1.50@1.55	
1750	Sierra Nevada	4.40@4.45	
500	Solid Silver	30@35c	
400	Scopion	55c	
1000	Silver Hill	15c	
100	Utah	2.20	
750	Union	4.55@4.60	
20	Yellow Jacket	3.30	

AFTERNOONS SESSION.

160	Andes	50c	
200	Alpha	2.15	
350	Alta	1.30	
400	Benton	20c	
150	B. & Belcher	3.15	
50	Belcher	1.05	
260	Chollar	2.60@2.65	
150	Crown Point	1.20	
100	Con. Virginia	45c	
50	Confidence	1.50	
100	Exchequer	60c	
50	Eureka Con	61	
150	Gould & Curry	2.35	
170	Hale & Nor	3.75	
600	Justice	45c	
200	Mexican	2.35	
200	Navajo	2.65	
320	Ophir	3.65	
160	Potosi	95	
150	Savage	1.45	
1370	Sierra Nevada	4.40@4.10	
80	Utah	1.95@2	
710	Union Con	4.40@4.30	
100	Yellow Jacket	3.10	

"CREDIT: ITS MEANING AND MOMENT," is the title of a neatly printed little pamphlet by Clark W. Bryan, proprietor of the *Paper World and the Manufacturer*. It reflects the impression of a critical observance on the subject of mercantile agencies, and will repay perusal by all who have an interest in the working and management of such institutions.

Mining Share Market.

Very little of interest is going on in the mining share market just at present. Some of the mills on the great lode have started, and when they all are, some 800 men will be put at work along the Comstock.

The connection of the north drift on the 2900 level with the winze down from the 2700 level will open ground to exploration, and prospecting will presently be active to the northward in the Sierra Nevada.

At the Union Consolidated they are cutting many small streaks of good ore in west cross-cut No. 2 on the 3000 level.

At the Mexican they will soon have completed connection between the 2700 and 2900 levels, when prospecting may be commenced in a very interesting section—a section in which some paying ore is known to exist.

At the Ophir they are now in a position to open up a large space of ground in the upper levels lying to the west of the old early-day workings. In this section there is known to be some seams of rich ore and much ore of low grade. Not only will the ground at and above the 150 level be explored, but a winze will be sunk to the depth of 200 ft below said level, and the ground at that depth also prospected.

At the Hale and Norcross, they will now soon be ready to crosscut and thoroughly explore their 2700 level.

The following companies had cash on hand Oct. 1st: Exchequer $17,867.21, Crown Point $21,170.54, Ophir $61,519.68, Mexican $21,490.67, Con. Virginia $84,693.76, Syndicate $4 977.82, Genesee Valley $3,758.77, Pedro Con. $10.55, California $857, Gould & Curry $18,778.17, Occidental $5,809.01, Utah $4,561, Northern Belle $43,771.90, Alpha Con. $6,458, Bulwer Con. $411, Standard Con. $161,509, Mono $2,729, Bodie Con. $32,323, Summit $1,406.15, Tioga $842, Double Standard $36.20, Booker Con. $403.38, Savage $11,475.48, Potosi $35,991.58, Chollar $91,604.60, Jackson $4,289.46, Justice $8,000, Andes $6,000, Navajo $2,639.97, Union $17,422.77, Alta $28,109.40, Benton $6,313.89. The following companies had an indebtedness on October 1st: Best & Belcher $7,119, Bechtel $93.04.

Bullion Shipments.

Mt. Diablo, Sept. 27th, $4,963; Standard Con., 24th, $37,381; Contention Con., 30th, $13,544; Ontario, 26th, $12,038; Vienna, 26th, $1,502; Horn Silver, 26th, $12,000; Hanauer, 27th, $4,500; Crescent, 27th, $5,880; Horn Silver, 27th, $9,000; Ontario, 27th, $4,419; Vienna, 28th, $1,555; Ontario, 28th, $6,597; Horn Silver, 28th, $6,000; Hanauer, 30th, $4,500; Nevada, 30th, $2,020; Ontario, 30th, $7,186; Vienna, 30th, $1,475; Horn Silver, 30th, $12,000; Silver Reef, (for Sept.), $35,002; Bullionville, Oct. 2d, $2,035; Horn Silver, 2d, $21,000; Ontario, 2d, $13,920. During the week ending Sept. 29th, inclusive, there were shipped from Salt Lake 57 cars bullion, 1,460,536 pounds, sent East; 39 cars ore, 820,100 pounds, sent East; 2 cars ore 48,350 pounds, sent West; and 1 car white lead, 25,000 pounds sent West; making a grand total of 99 cars, aggregating 2,353,986 pounds.

So many cattle have been sent over the California line from Nevada that the complaint is made of scarcity in the Sagebrush State.

A CARGO of wheat valued at $45,000 cleared from Wilmington for Cork Saturday.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Alpine

ISABELLE G. & S. M. Co.—*Monitor-Argus*, Sept. 28: The Exchequer mill is kept running steadily on Stella ore. There are now about 75 tons of ore at the mill ready to be worked, of which the average assay value is $75 per ton.

Amador.

RICH STRIKE.—*Ledger*, Sept. 29: A rich strike is reported from the Calaveras side of the Mokelumne river. The discovery was made by some of the men employed at the Mammoth mine, and was located in behalf of the discoverers and W. A. Nevills. Some specimens of black ore, similar to that met with in the famous bonanza of the Mammoth mine, were obtained.

MAMMOTH.—The seam of free gold near the surface has not been worked to any extent, on account of bad air. When the men were compelled to quit, the seam was three inches in width. The efforts of the miners are now directed towards improving the ventilation.

ZIELE.—The Ziele mill is idle, owing to the water being shut off for the purpose of cleaning out and enlarging the branch ditch, which work was commenced Friday afternoon. It will take a week to complete.

AMADOR CANAL.—Ten or twelve hands are employed by the Amador Canal Co. in digging the ditch for the second pipe across Jackson creek. The pipe will be 15 inches in diameter. It will necessitate the cleaning out of the Moore ditch, and its enlargement in places. The job will take two or three week.

El Dorado.

POCKET MINE.—Georgetown *Gazette*, Sept. 29: We visited Sam Watson's new pocket mine, from which he has taken more than a thousand dollars within the past few months, and has a good prospect of taking out more. This claim is a mile and a half south of town, and on the same line of slate which passes through the Rich Gulch and Crane's mines. Mr. Watson has now before his eyes an evidence of more pockets near by. Much of the quartz he has been sluicing and throwing away he has discovered will pay to mill. Some pieces of the quartz we found lying around showed well in gold.

Inyo.

BROWN MONSTER.—*Independent*, Sept. 29: Four men are taking out fine galena ore for shipment from the Brown Monster mine. At present 10 tons are sacked and ready for transportation. A lot of Mexicans are extracting ore on the hill above the Brown Monster.

THE OLD "UNION" MINE. Silas Reynolds and T. Treglowen have 15 tons of ore on their dump ready for shipment.

THE HIRSCH. A fine body of copper of high grade, together with a showing of galena, has been recently exposed.

CERRO GORDO.—The rumor comes that new parties are intent upon mining in old Cerro Gordo district. A couple of men lately made an important strike in an old mine formerly worked by Jack Moore. The ore vein is 12 or 14 inches wide, and consists of silver-lead assaying $1,000 to the ton. It is said that Belshaw is making arrangements to return in person and start up the old Union.

Mariposa.

DILTZ MINE.—*Gazette*, Sept. 29: The shaft upon this mine has reached the depth of 114 ft. At this depth vein and vein matter show five ft in thickness between well defined walls. The vein, some of which is solid and some discomposed, is all diffused with gold, and grows richer as the shaft goes down. During the week several tons of ore have been stoped out from the 75 level, which opens out most satisfactorily.

CANNON.—This mine is contiguous to the Diltz and belongs to the same property. Within the past week Captain Diltz has reopened this old mine and extracted several tons of ore, which upon test show that the rock will average from $12 to $15 per ton. It is a well defined vein four ft thick, and shows free gold.

BUENA VISTA.—This mine is half a mile from the above. Captain Diltz has had the group of mines fully represented to a London company, who have the same under consideration. It is hoped something will be done toward developing these mines.

Modoc.

RICH DIRT.—Adin *Argus*, Sept. 20: One day this week one pound of dirt taken from the Juniper mine at Hayden Hill was washed out carefully and found to contain $16.75 in gold. This statement is vouched for by our Hayden Hill correspondent, a reliable gentleman and practical miner.

ANOTHER.—J. W. Hayden, one of the two original locators of Hayden Hill mining district, and the man for whom the hill and district are named, has discovered a new gold mine, seven miles east of Hayden Hill.

MORE ABOUT IT.—The new mines discovered by Messrs. Hayden and Lewis have caused no little excitement. A new Mining District has been formed, called the "St. Louis." Seven claims were staked off last week, many more locations will probably be made.

Mono.

MAY LUNDY.—Homer *Index*, Sept. 29: The stopes in the May Lundy have shown no change during the week, but a decided improvement in the lower levels is observable. The face shows four feet of clean ore of high grade, much of it horning out $200 to the ton. The south drift is carrying 20 inches of very rich ore.

GORILLA.—The Gorilla mine and reduction works are being run day and night. The mine is in excellent condition. During the week work was resumed on the Lucky Morton, the first northerly extension of the May Lundy.

JORDAN.—The Virginia Creek Hydraulic Co. is shipping considerable quantities of gold dust from their works near the Old Mono diggings.

STANDARD CON.—*Free Press*, Sept. 29: The Standard Con. mill resumed operations yesterday, much to the satisfaction of all hands. The new engine is of 170 horse-power. Everything is now in excellent order, and the roar of the dropping stamps will make pleasant music through the entire winter.

Nevada.

NEVADA CITY MINE.—*Transcript*, Sept. 20: At the Nevada City another level is being sunk for, the incline now being about 35 feet below the 600. The next level will be started at a depth of 700 or 750 ft, as may be decided later. The mine is paying profits right along.

BUELOW.—There is in the Buelow Con. claim a ledge 80 feet wide and cropping out at the surface, that promises good results. While out there Sunday Dr. Buelow got a lot of the ore, which is greenish in color and of slate formation, and has had several assays made of it. By amalgamation it gives $8 a ton and by fire assay $70 to $80. It is alive with sulphurets.

DERBEC.—Grass Valley *Tidings*, Sept. 28: We visited the tunnel of the Derbec mine in company with Mr. De Noon, the Supt. There has been a great deal of work done about that institution. Work has been in progress a year and four months, and as a result, they have a tunnel in the hill 3,800 feet, through which the gravel is hauled in cars holding nearly a ton. About 250 loads of gravel per day are taken out of the tunnel.

Placer.

A SALE.—*Herald*, Sept. 29: We gave it as a rumor that the Hawkins and Peardon boys had sold their mine, the Morning Star, at Shipley ridge, below Ophir. The sale of the Belmont, located near by, is also reported in this week's paper. The two mines, we understand, are sold to one company, the reported price for both being $130,000.

BELMONT.—I am informed by good authority that the Belmont mine has changed hands to Eastern parties, understood price $65,000.

DAMASCUS.—T. C. Brome, of Damascus, says the old Bob Lewis drift claim at that place, owned by Lewis and Griffith, is paying first-rate, and as soon as they can arrange for getting more water to wash their gravel, will show big. They are on a lead of blue gravel that is proved to be rich and extensive. In the old Mountain Gate they are preparing to put in a large overshot water wheel underground for the purpose of pumping the water and hoisting the gravel from the rich blue lead channel, some 40 ft below their old tunnel.

PENNSYLVANIA FLAT.—Placerville *Democrat*, Sept. 29: D. M. Jacott came over on Wednesday from Pennsylvania Flat, in Placer County, where the Ralson Bros., Samuel F. and William C., Jr., are working the gravel claim formerly operated by Blair and Peas. These young men are getting the claim is first-class shape for operating on a large scale this winter. Mrs. W. C. Ralston, mother of these young men, has gone up there to make her home.

Plumas.

GOLD STRIPE.—Greenville *Bulletin*, Oct. 2: On Monday morning the miners in the Gold Stripe stopped worked. The mill will continue to run until Friday, when all the ore at the dump will be worked up. It is reported that there is no ore in sight and that no prospecting will be done unless the shareholders furnish money.

San Bernardino.

CALICO.—W. T. Grant writes the Inyo *Independent*, of Sept. 29: I do believe that in one year San Bernardino will be the banner mining county of the state. The King mine is turning out a whole lot of bullion monthly. Uncle Billy Raymond has got his fins in again, and is going to make bushels of money out of his interests here, particularly the Garfield mine. All his old friends say he has struck the right country again. He is now in the city looking after a mill to work his ores.

Shasta.

DEADWOOD.—*Democrat*, Sept. 26: Tom Green was in town Thursday to receive a small quartz mill and engine he purchased below. The mill has a capacity of six tons. It was shipped to Deadwood, and will be erected on his claim immediately. Tom is satisfied he will make some money.

NOTES.—*Republican Free Press*, Sept. 29: Mr. Flemming's mine pays better than ever. He has just been rewarded with $155.50—the result of ten days' run. Dan O'Neal has just made a clean-up; he would not tell how much he made, but to judge from the pleased expression of his countenance it was immense.

Sierra.

INDEPENDENT.—*Tribune*, Sept. 27: F. Harland, last week secured a bond until the 1st of next July on the Independent quartz mine, 10 miles south of this place. The Independent and Franco-American quartz lodes are prominent on account of their large croppings. The first was worked as early as 1860, arastras being used. In 1868 an 8-stamp mill was built at a cost of $6,500. The mill has a capacity of 8 tons in 24 hours and is driven by a 20 ft overshot wheel. The quartz is rich in free gold and also contains a high percentage of rich gold-bearing sulphurets. We are informed that the mine has yielded $20,000 during the time that the mill has been run by the present owners. The average of the ore is $20 per ton.

Trinity

DEADWOOD.—*Journal*, Sept. 29: John E. Gibson writes us that they have struck the lode in the Enterprise mine at 185 ft, the rock averaging from $25 to $30 to the ton, and indications favorable for better when they get further in.

GETTING READY. James Blakemore tells us that they have 12 men at work on the ledge on Jenning's gulch, and are building an arastra. Everything is in good shape, the rock looking splendidly, and when water comes they will take out money.

NEW RIVER. Cor. *Journal*: San Francisco parties have purchased the Portuguese mine on Big Flat and Boles & Gulich's Devil Canyon ditch. They intend extending down the river for the purpose of working Rattlesnake Bar opposite Big Flat. Boles & Co. have gone down 56 ft, the vein is 30 inches wide at the bottom of the shaft and prospects $50 per ton. Mr. Sherwood has men of capital interested with him. They are down 70 ft and have 45 tons of ore on the dump that assays $60 per ton. Ladd, Clifford & Co. have a splendid overshot wheel, 24 ft in diameter. G. V. Healey, on his Ridgeway ledge, is pounding out from $4 to $6 per day with a hand mortar. R. L. Thomas has discovered an extension of the Hard-tack lode that prospects big.

FRENCH GULCH. *Republican Free Press*, Sept.

29: Muldoon, the superintendent of W. P. Coleman's mine, is in high spirits. He says the mine never looked so well, and is now showing first-class ore, sufficient to keep a 10-stamp mill going for a solid year. E. Franck and the McDonald boys have also struck recently very rich rock.

Tuolumne.

SHORT OF WATER. *Independent*, Sept. 29: The water was shut off from the main ditch of the T. & W. Co. on Thursday, and there will be no more water from that source until the rains set in. This necessitates the shutting down of the Quartz Mountain mill, the Little Gem mine, and the gravel mines in Table mountain.

RICH QUARTZ. *Democrat*, Sept. 29: Some exceedingly rich quartz is being taken out of the Soulsbyville mine at Soulsbyville. Some of the rock goes as high as $200 per ton. A very good quality of quartz has been struck in the Rising Sun mine below the tunnel. Work on the new mill is progressing rapidly.

NEVADA.

Washoe District.

UNION CON. *Enterprise*, Sept. 29: On the 3000 level west cross-cut No. 2 is out about 22 ft. It is still cutting streaks of ore. These streaks have swung around to the west till they are now going in nearly the same direction as the cross-cut. The 7-ft streak of ore has probably turned in the same direction as the smaller outlying streaks; at least, nothing like it has yet been found.

OPHIR. Are now getting things in shape for regular mining. On the 150 level connection has been made with the winze down from the works in the old croppings. This connection gives a good circulation of air, and the winze may be utilized as a chute down which to send ore from the openings in the croppings. A winze will now be sunk well out west, to a depth of about 200 ft, and the ground opened in good shape.

HALE AND NORCROSS.—The station on the 2700 level is nearly finished. From this station a drift will be run a short distance north, when it will be turned west as a cross-cut. On the 2000 level the cross-cut going west is out about 25 ft. It is cutting streaks of quartz that stand nearly vertical.

MEXICAN.—The upraise from the 2900 level will soon connect with the bottom of the winze down from the 2700 level. There is but a few feet to go to reach the bottom of the winze. The northwest drift on the 3100 level is still advancing in dry ground.

SIERRA NEVADA.—The north drift on the 2900 level is advancing at the rate of 25 ft per week. The joint Union Con. winze below the 3000 level is fast approaching the 3100 level. The bottom is showing streaks of quartz of low grade.

ALTA.—The water is being rapidly drained from the lower levels. The tanks and pumps are kept in constant motion.

UTAH. Good headway is making in the north drift on the 1350 level. The ground is in vein porphyry, which blasts well.

COMBINATION SHAFT.—The station below the 2600 level for the new hydraulic pump is being excavated very rapidly, and will soon be completed. It will form a vast hall 100 ft long, 25 ft wide and 15 ft high.

YELLOW JACKET.—Very little can be done in the way of mining at present, but all is being kept in excellent order for a start as soon as there is sufficient water in the Carson river to start the mill.

SCORPION.—Good progress is being made on the 500 level on the west cross-cut. Occasional streaks of quartz of good appearance are being cut.

SOLID SILVER.—During the week have been engaged in clearing the track of the rock that had fallen upon it in many places from the roof of the tunnel.

IMPERIAL.—They have had steam up at the hoisting works, and will soon be ready to begin mining operations in earnest in the old upper level.

CROWN POINT.—Nothing is now being done in the mine, but all is in good shape for starting up as soon as the mills on the Carson river can be run.

NORTH GOULD AND CURRY.—Good progress is making in sinking the shaft. At present they are engaged in timbering up at the bottom.

CALIFORNIA.—Are again sinking joint Consolidated Virginia No. 2, and fair progress is being made in the work.

BEST AND BELCHER.—The west drift is gradually draining out, and work may soon be resumed.

GOULD AND CURRY.—East cross-cut No. 3 is being advanced in vein material of favorable character.

CON. VIRGINIA.—Good progress is being made in sinking joint California winze No. 2.

BELCHER.—Are awaiting the starting up of the mills on the river.

OVERMAN.—Are extracting some ore from the old upper levels.

UNION SHAFT.—Are easing timbers at the 2300 station.

Belmont District.

OPHIR CANYON.—*Courier*, Sept. 22: A. Lognoz denies the report that the mill in Ophir Canyon has shut down and that work has been suspended. He says the mill is running night and day and is producing the usual quantity of fine bullion. It is probable that a sufficient amount of money will be raised to sink the shaft.

BELMONT MINE.—The report from Supt. Fassett, for Sept. 22d, is as follows: "The level in Laity ground is 268 ft in length. Stopes looking well. The first cross-cut, 110 ft south of Highbridge shaft, is just started into the ledge, showing good $100 ore. Moore & Marting ground yielding high grade ore. Shall commence extracting ore from South Tunnel on Monday."

JEFFERSON.—The work of extracting ore from the Keystone mine at Jefferson progresses nicely. Work in the Jefferson Carbonate mine is pushed with energy, and the ore now being extracted is of excellent quality.

Eureka District.

ANOTHER SET-BACK.—Eureka *Sentinel*, Sept. 29: A fresh fountain somewhere broke loose yesterday in the Eureka Con. new shaft and caused the water to rise to 75 ft. On Wednesday all was working well, the water in the shaft having been lowered to 29 ft. Work has been stopped for the present, and the pump will be taken to the surface and overhauled, when it will be started up again. Had not this additional flood come in, the shaft would have been dried to the bottom in three or four days more.

NOTES.—A strike of good ore was yesterday reported in the Prospect Mountain tunnel. A promising change is noted in the formation in the extension of the flue dust tunnel at the Albion. The quality of ore from the Geddes mine at Secret Canyon is rapidly improving. The Kelley mine at Secret Canyon, is being worked on lease. The shaft is 70 ft deep, and in a drift run from the bottom of it some very fine ore has lately been struck. It is stated that the new find in the Albion mine is a good one. The ore body is in virgin ground at a distance from where any ore has been found heretofore. The body is 18 ft from wall to wall, and the ore gives assays as high as $130 per ton.

Bernice District.

GOLDEN CROWN. *Silver State*, Sept. 15: O. G. Rappleye arrived from Bernice yesterday. He says the mill is running on ore from Wallace Goodell's mine, the Golden Crown. Water is scarce in the district just now, and the supply is barely sufficient to run the mill. There is ore enough to sight in the mines partially opened to run the mill for years.

Humboldt District.

CEDAR. *Silver State*, Sept. 24: A new mining district has been organized in the Antelope range of mountains, 18 miles from Humboldt house, and named Cedar district. Years ago rich float rock was found in that section, but nothing was done towards tracing it up. This summer Jehiel Smith found some galena partly oxidized near the base of a bluff, which led him to prospect. He succeeded in finding a body of galena 20 ft wide, and carrying from $100 to $200 in silver to the ton. He has been for some weeks prospecting his find, and is of the opinion that it is one of the largest bodies of ore ever found in the State.

Tuscarora District.

ARGENTA. *Times-Review*, Sept. 27: North cross-cut on the 400 level is in 106 ft. Progress for the week, 10 ft.

ELKO CON. Shaft No. 2 has been extended 6 ft during the past week. Total depth 137 ft.

NORTH BELLE ISLE. Fair progress has been made in extending the drift south on the 300 level. Stopes on the 70 level are without change.

NAVAJO. Total length of cross-cut east, 650 level, 54 ft. No work will be done in the west cross-cut until the pumps are in working order.

GRAND PRIZE. West drift in the 300 level, north lateral drift, is in 155 ft. Progress for the week, 13 ft. North cross-cut on the 400 level is in 66 ft. Progress for the week, 24 ft.

BELLE ISLE. Cross-cut east from north drift, 450 level, has been extended 8 ft. Work in the face of the drift has been suspended. Upraise from the 350 level has been carried up 19 ft.

INDEPENDENCE.—Total length of drift north on the 300 level, 816 ft; progress during the week, 21 ft. The flow of water continues about the same. Upraise from the 400 level has been carried up 20 ft and timbered.

ARIZONA.

TOMBSTONE.—*Epitaph*, Sept. 25: Work on the pumps in the Contention mine is going on, the old Flora Morrison hoisting engine being now in place. The pumps are a double set of 12-inch Cornish pattern, similar to those used on the Comstock lode. These will be the largest pumps yet erected in this territory. They will be in running order by December 1st.

PROMPTER.—The ledge, running through the entire length of the claim, is worked by seven shafts, the deepest, No. 5, being down to a depth of 340 feet. While making connection between shafts Nos. 4 and 5 a large body of ore was struck. Of six assays made of this ore, the lowest went 135, while the highest carried 2,423 ounces of silver to the ton. Drifting is being pushed on vigorously, and large quantities of ore are accumulating on the dumps.

GREENLEE.—There are about 150 claims now taken up in the new silver district, and the work of developing some of the richest claims has already commenced. Several shafts are being sunk, and as depth is gained the ore increases in quantity and quality, there being gold enough to pay expenses of extracting the ore. The highest assays made, so far, returned 1,281 ounces silver and $27 in gold. One assays, from pieces of rock knocked off from the surface of the ledge on 13 different claims, returned 168 ounces silver and $24 in gold. If these mines prove to be as good as is anticipated by experienced miners, the new camp will be one of the richest in the territory.

GROUND HOG.—*Epitaph*, Sept. 22: The latest strike is in Ground Hog, which occurred yesterday at a depth of 103 ft. The vein had gone down to that depth, carrying ore which averaged about $75, when yesterday the workmen came upon a streak about 8 inches wide which was literally filled with silver, the pay being fully 3 ft wide, and averaging up into the hundreds. A sample of the horn-silver can be seen at the Billiard Parlor, which will do your eyes good to look at.

OLD DOMINION. *Silver Belt*, Sept. 22: Shipments of Old Dominion for the week: 856 bars—237,680 pounds. Second furnace was started on Saturday last. Good supply of coke, and teams are arriving daily with more.

ROGERS DISTRICT.—Pinal *Drill*, Sept. 22: On the Robin, assessment work has been done. The shaft is down 90 ft, from the bottom of which they have drifted 35 ft, on a pay streak two ft in width. There are 30 tons of ore on the dump. On the Worldbeater, work started on a new shaft at the top of the hill is now down 16 ft, disclosing a four-foot vein, with a pay streak twelve inches wide, of very good ore. On the Silver Chief, assessment work has been done. A drift 18 ft long from the bottom of the shaft shows two ft of very rich metal, in white quartz. The Chief looks better now than it ever has done since its discovery. On the Snap, Mr. Tolles is taking out fine ore from a drift in the vein. He has a big pile of ore on the dump.

SOUTHERN PIMA.—Tombstone *Epitaph*, Sept. 19: J. R. Manning, of Crittenden, Pima county, represents his section as being in a prosperous condition. The Alta mine at Harshaw, owned by Luttrell & Salisbury, has been pumped and the extraction of ore is progressing. The ore, which is said to average $75 per ton, will be shipped to the Benson smelter at the rate of one car-load 115 tons) daily. On the western slope of the Patagonias, Judge Fuqua and others have recently made an extraordinary discovery. It consists of a mammoth ledge 100 ft in width, in which occur frequent stringers of native and horn silver. The owners are quietly developing their property, and Mr. Manning thinks it will prove to be one of the biggest mines in Arizona.

PINE SPRING.—Prescott *Miner*, Sept. 21: The Pine Spring it down 100 ft. Drifts are now to be run in on the ledge south and north with a view of ascertaining whether the rich ore found in the shaft extends along the ledge. If the same extends any considerable distance, the Pine Spring can be put down as the richest property in Arizona.

HIDDEN TREASURE.—*Courier*, Sept. 22: Theo. L. Chase, of the Hidden Treasure Co., Turkey creek, was here yesterday. From him we learned that he has, in dump, 150 tons of ore that will pay. The Hidden Treasure is opened by shaft to a depth of 200 ft.

COLORADO.

LITTLE EMMA.—Georgetown *Courier*, Sept. 20: The Little Emma mine, on Democrat mountain, is proving itself one of the richest. Some very high-grade mineral is coming out. The following are some of the late mill runs of mineral taken from this level, as shown by the assay certificates of the Rocky Mountain mill: 554 pounds ran 136 ounces per ton; 168 pounds, 446 ounces; 4,924 pounds, 371¼ ounces; 466 pounds, 1,149 ounces silver per ton. The average mill run of all the ore produced is over 500 ozs. This can not be beaten in the State. Assays of the ore have run as high as 27,000, and mill runs 11,000 ounces per ton.

SUMMIT CON.—This mine, on Saxon mountain, has made a recent strike. The 179-foot level from the main shaft is in excellent pay. A cross-cut from the bottom of the main shaft was started for the purpose of striking the hanging wall, when, at the distance of 11 feet, a body of rich ore was encountered. A mill run of the ore from this level was made with the following result: 1st class, 1,440 ozs.; 2d class, 328 ozs.; 3d class, 119 ozs. silver per ton. The run of the 3d class ore was made merely to ascertain whether or not it would pay to treat.

BONANZA.—Pitkin *Independent*, Sept. 22: The developments of the Bonanza include 100 feet of incline and a 26-ft shaft—the last 25 feet of incline following about five feet of mineral in place, all pay, and mostly rich. The ore contains chlorides, sulphurets, silver-glance, and carbonate of lead. Assays lately obtained are as follows: No. 1, 48 ounces silver per ton; No. 4, 219 ounces; No. 5 (picked), 532 ounces. A good road has been constructed and a car-load of ore is now being delivered at the sampling works. We understand that the mineral which has latterly been followed in the Bonanza was discovered in 1879, when a small but handsome streak of ore was exposed. The owners, wishing to sell, and fearing a pinch, were timid about going in on it, and have since been gophering around to open the vein in another place. Lately, urged by some of our best miners, they began running on the mineral, and in less than ten feet had a five-ft breast of ore, which has since averaged that width, and passed from line into good quartzite and porphyry walls.

JOE REYNOLDS.—*Miner*, Sept. 22: Three of the four lodes composing this famous Silver creek property are being actively worked by seven parties of lessees, numbering in all twenty-four men. East of the Abeel cross-cut they have opened up ten inches of solid, high-grade ore, from which an assay of 2,200 ounces has just been had. About eighteen months ago the lodes were practically abandoned. James Dailey, the present Supt., had run 140 feet, following the soft gangue which was then supposed to be the only road to the mineral. After exhausting all his resources, he one day drove a drill into the north wall. At three inches it struck something hard. He continued pounding away, dulling every drill, until a seven-inch hole was finally bored, and a shot put off in it. Twenty inches of rich mineral was uncovered, which has since been shown to extend, with some variations, the whole length of the 140 ft of level above mentioned, and how much farther no one yet knows.

LITTLE ALICE PLACER.—*Register-Call*, Sept. 21: The lessees of the Little Alice company's placer mine last week cleaned up fifteen sluice-boxes from a five day's run, four miners working, the yield being 85 ounces, which bronght at the bank in Denver $16.50 per ounce. Several pieces of native silver were taken out of the sluices, one of them weighing righteen pennyweights.

IDAHO.

MORTON.—Wood River *Times*, Sept. 19: Price and Scott agree to put a force of men at work on the Morton mine immediately, and take the property within sixty days. The price to be paid is $20,000, in three payments, two of $5,000, and one of $10,000. This is for 100 feet of the ground.

SAWTOOTH.—Ketchum *Keystone*, Sept. 19: A. L. Richardson, who returned from Sawtooth last evening, reports considerable stir in Sawtooth, from the success of the Columbia and Beaver mill. The camp is picking up life, and everybody is possessed with hope that the day of resurrection has arrived. The C. and B. mill was to have turned a large bar ont to-day.

ELKHORN.—We are informed by Supt. Lewis, of the Elkhorn, that new developments have placed in sight large bodies of high-grade galena. This shows a continuous body of first-class ore, and exhibits the property to greater advantage than ever before. The average net receipt for every ton of first-class ore shipped from the mine to the Philadelphia smelters is $165, after transportation and reduction. Thirty-five men are employed on the works.

ALVIN.—The Alvin mine, on Boyle Mountain, has received the following returns from the Philadelphia smelters for 131 sacks, weighing 16,855 lbs. net of first-class ore. The value per ton, $196.05; deduction for cost of smelting per ton, $47.05; net receipts per ton, $149; total receipts, $1,256.11. This is the yield of one prospect barely developed into a mine.

LOST RIVER.—*Keystone*, Sept. 22: The newly discovered mineral belt on Lost River, from the headwaters of Alder creek to the headwaters of Antelope creek, is about 10 miles long and 5 miles wide. The Hermes mine, discovered in July and owned by McAllister and Powers, has been developed to a depth of 20 ft, first appearing on the surface as a 14-inch vein and now widened to 3½ ft of good carbonate and galena ores, with an average assay value of 127 ounces silver and 70 per cent lead. The Hermes contains a ledge of 6 or 7 ft, with good walls. The highest assay returns for the ore are 200 ounces. Woodruff's copper mine is one of the biggest things in the country, and is reported similar to the famous Peacock copper mines in Northern Idaho. It is of such magnitude as to require parallel locations to include the whole. Extending over the entire width, large bodies of rich copper ore are found, and the whole gives the appearance of a well defined ledge, with walls in place, on an immense scale. The ore runs from 16 to 30 per cent copper.

PHILADELPHIA. Ore receipts at the Philadelphia smelters have grown so large that the company has been obliged to place a limit on the purchase of high-grade ores until better transportation than the winter season will allow does away with the risk of too much dormant capital.

BANNER. Idaho *World*, Sept. 18: The Banner mine has a rich pay rhute 300 ft in length, and how much further is not known. They are still going ahead with east drift, and the vein holds its width, and the ore continues rich.

MONTANA.

ALICE.—Butte *Miner*, Sept. 18: The underground workings of the Alice never looked better. The west drift from the 800 has advanced 125 ft on the ledge, which maintains its general width and grade; sample assays yesterday yielding 60 ounces in silver. The vein developed in the 100 and 200 ft east drifts has been uncovered in the 300, showing 3½ ft wide in the face of the drift and assaying from 40 to 60 ounces. The mills are with their 80 stamps doing extraordinary work, 2884 tons of ore having been milled in August, producing bullion valued at $117,300. The money that would have been disbursed in dividends has been applied to the acquisition of the Magna Charta and the Valdemere, to putting in new machinery, to building the great tramway, and to the development of the property. These are dividends which are trangible.

BELL.—The Bell mine is 400 ft down in its new shaft, where the vein measures from 8 to 24 ft thick, and is all pay ore. A splendid block was shown weighing over 200 pounds and covered with native silver, containing about $250 worth of it, and 50 per cent of copper. The mine has a 60-ton smelter in operation, and ships 10 tons of matte per day.

LEXINGTON.—The Lexington is 500 ft deep. It has 60 stamps in operation. The output from January 1st for seven months has been $742,000. The ore pulps $55 per ton. The mine showed specimens containing native silver.

ANACONDA.—The Anaconda is by many considered the second best copper mine in the world after the Calumet and Hecla. The company is putting in machinery costing $90,000, a 500-ton smelter being part of it. There is a 40 ft vein of solid ore carrying from 20 to 70 per cent of copper.

NEW MEXICO.

FLEMING.—*Southwest Sentinel*, Sept. 22: The Columbia is one of the most promising prospects in Grant county. The shaft is now 70 ft in depth, and shows from the surface to the bottom a well defined vein of ore having a milling value of $125 per ton, and extra selected first-class will mill from $500 to $800 per ton. The vein occurs in granite, runs north of east, and is almost vertical in its slip. The mineral consists of chlorides and sulphurets of silver associated with heavy spar and talcose matter.

IVANHOE.—"We are running all our silver ores into copper matte—Ivanhoe ores with our custom ores. The matte assays 50 per cent copper and averages 150 ounces in silver. We have now ready for shipment three car-loads of matte, and have already shipped several to Denver. We are smelting forty tons of ore every twenty-four hours. We made one run of twenty-four hours on raw Ivanhoe galena ore and got out seven tons of lead bullion, assaying 35 ounces per ton in silver."

OLD MAN.—The Carrollton mill was sold at Sheriff's sale last Monday, and J. W. Fleming was the purchaser. The price paid was $7,060. Jack will at once put the mill in thorough repair, and start it up on Old Man ore. He expects to have a thousand tons ready for treatment by the time every thing is in working shape at the mill.

SILVER CITY.—Las Vegas *Gazette*, Sept. 19: The new discoveries and active operations in Grant county have produced marvelous results. To the output of the already well known mines have been added rich new finds. Fleming is regaining strength rapidly. The mines are showing up better every day. Thirteen hundred sacks of rich ore from the Old Man await shipment, and it is learned that the property is likely to be sold to Colorado capitalists. The Penrose group is being worked by the owners.

OREGON.

SNAKE RIVER PLACERS.—Reno *Gazette*, Sept. 26: It is reported to the Ogden *Pilot* that the placer mines near Eagle Rock, on Snake river are paying from $5 to $15 per day to the man, and that the ground is taken up for 8 miles.

WASHINGTON.

NEW PLACERS.—Walla Walla *Union*, Sept. 22: Hon. Jacob Stitzel reports that while at Spokanefalls he met Geo. B. Warnacott, of Rathdrum, who informed him that the new placer diggings in the Coeur d'Alene mountains are very rich and quite extensive. He had $100 worth of dust with him. The mines are about 80 miles from Rathdrum, and a point 20 miles from the mines can be reached by boats on the lake. The diggings are said to pay from the grass roots to the bedrock, about three ft. The gold is free from quartz and is rated by Portland assayers as "$16.50 dust." One nugget weighing $27 has been found. Over 100 men were at the mines, and more are are going in every day. At present only the rudest appliances, rockers and pans, for saving the dust are employed, and yet so rich is the ground that those in the mines are making from $10 to $20 per day "to the hand." A number of parties have been formed in the upper country to go to the new mines, and a big rush is expected.

Carmelita.

[Written by JEANNE C. CARR.]

Carmelita is a Hebrew word with a Spanish termination, and means simply "a little orchard or vineyard." Thus our home had named itself before the house "with many windows" enlarged for us the ever beautiful and varied landscape of Pasadena. The house, a trap to catch the winter sunshine and every passing summer breeze, is planned for living in the open air. Every room in the two main stories opens upon a veranda or balcony, while the spacious deck upon the roof invites to star-gazing, and commands a glorious view of eighty miles of mountain range, and a glimpse of the peaceful sea.

It may be a useful study for some of the readers of the PRESS this house plan of ours, which is little more than the old-fashioned square house of four rooms on each floor, and a central hall or vestibule, into which all the rooms open. By reference to the floor plan of the main story (page 214) it will be seen that two modifications of this very common style give all the picturesque effect, viz: making an entrance in the corner of a room, out of which a veranda has been taken, and breaking the too formal outline of the roof by throwing up a very simple tower. A veranda around a house of the size required for our purposes was too expensive both to build and keep in order. We find the plan we adopted gives us every advantage, with the additional one of leaving our views more unobstructed. The reception room, divided by a portico from the staircase hall, is a cosy apartment. Its balcony or veranda is made to serve three stories, as it gives a balcony to the three chambers, and covers one entrance to the basement. One of the most difficult problems in home building is the placing of bath-rooms, water-closets, woodhouses, and sculleries, so as to meet the demands of convenience, good taste and sanitary science. Luckily for us, we are set on a hill, thereby the question of thorough drainage was not troublesome, but, on the other hand, the sightliness of the location forbade a "lean-to," or backyard, and not even a clothes-line was admissible here; hence the conservatory, with tankhouse over the bath-room, seen on the right of the picture. The broad steps leading from the east veranda cover a woodhouse and water-closet, which are entirely concealed from sight either from within or the outside. By placing the main story bath-room and closets in the end of the conservatory protection, perfect drainage was secured, and the necessity of having any soilor water pipe running under or within the dwelling obviated.

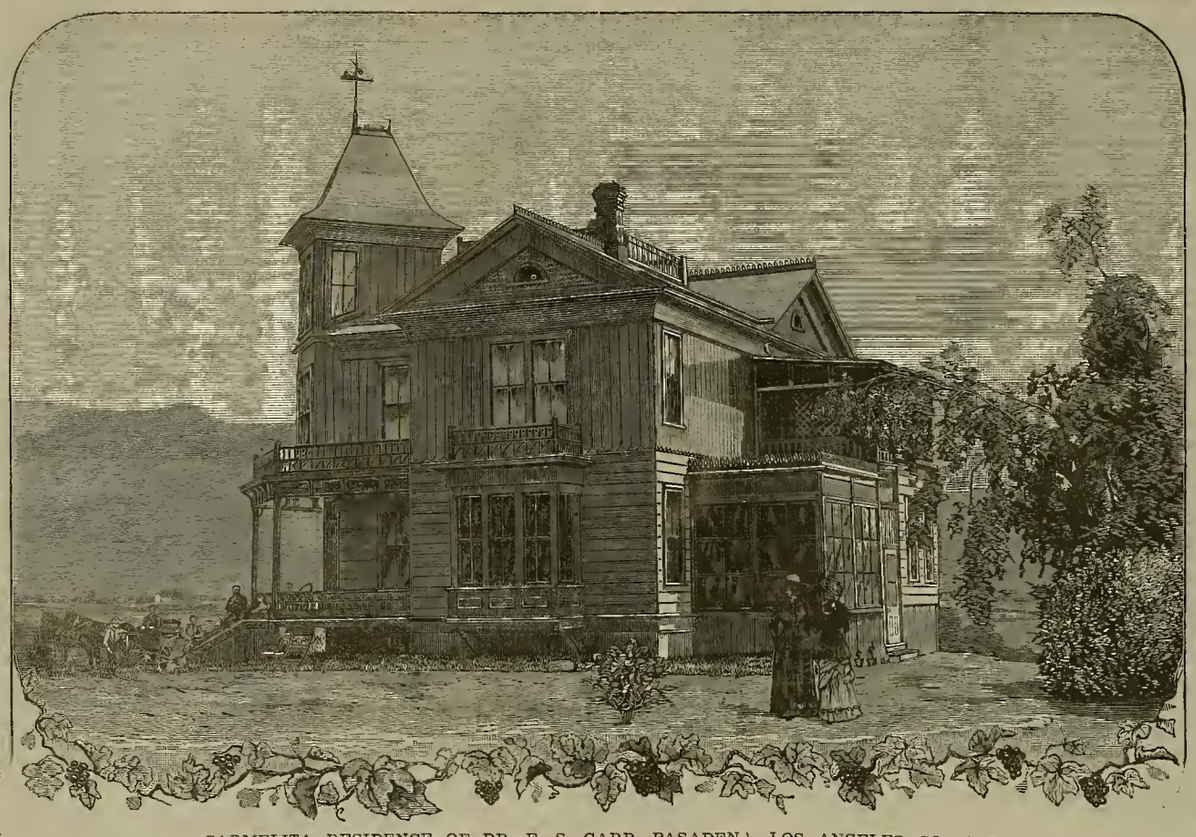
We could afford only one bay-window, but have the full interior effect of seven others, by placing the windows in the corners of the rooms wherever practicable. This plan greatly improves the appearance of the rooms, and gives better space for furniture. Poles and simple brackets hold the curtains, which make cosy alcoves of all these window corners. Wooden mantels and brick fireplaces help to keep the expression of a country home, which marble or artificial stone would have spoiled. All the woodwork of the interior is oiled or shellaced. The vertical boarding of the upper story is the natural color of the redwood; the main story is painted olive-green; the concrete walls of the basement Indian red. When our Bermuda grass carpet covers the lawn, and the ivy and clematis drape porch and window, we shall be satisfied with the effect. Most housekeepers hate a basement; but every one who sees ours is loud in praise of its convenience and pleasantness. The east side, which contains dining-room, kitchen and lobby, is on the ground level. All the windows command beautiful views. Pushing the excavation back into the hill we got an excellent cellar, light and well ventilated. This story is the most elaborately furnished. The lobby under the reception room is furnished as an office for our fruit business. An outside door leads into the garden; another door opens directly into the cellar where we have a large table for the exhibition of our dried and preserved fruits. During the Conclave week scores of Eastern visitors sampled the raisins, prunes and varieties of crystallized fruits. In the office we have a collection of cones and natural curiosities of the coast, and a standing exhibit of cocoons and silk of our own raising.

Those of the readers of the PRESS who have visited Woodward's Gardens will not fail to remember a picture opening from the pavilion into the tropic conservatory. Through a single plate of glass set in a gilt frame one sees into a wonderful miniature fernery, where beauty of form and grace of habit seem to reach perfection. Remembering this charming device, we incorporated it into the sideboard on the north wall of our dining-room. When the ferns are grown, and we use the hardier native species, one may see over their fronds the magnificent contour of the Sierra Madre, a living picture of priceless beauty, yet of trifling actual cost.

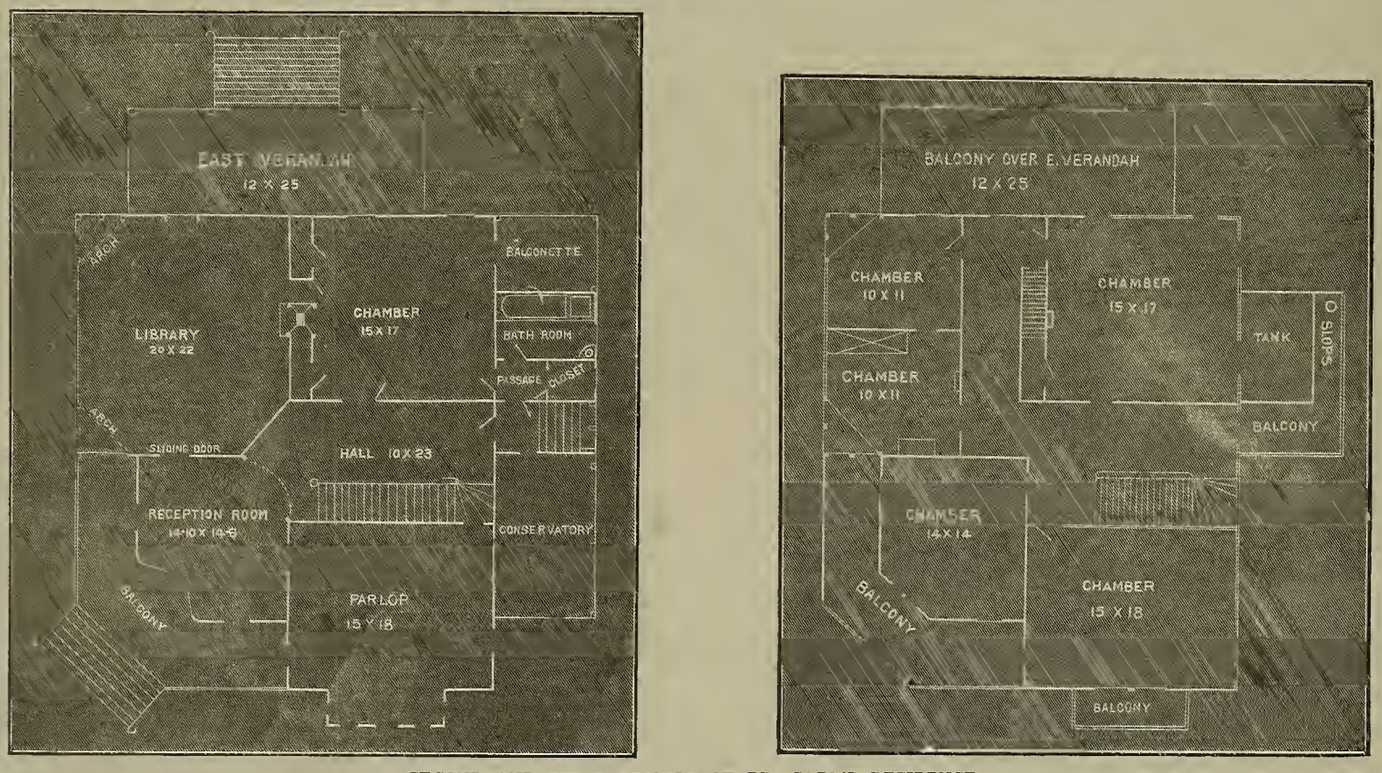
This dining-room is exactly a reproduction in most of its details of the Spanish adobe house. The square hearth tiles were once before the altar of the Mission Church at San Gabriel, and were many years since replaced by a wooden floor. Thus we have truly a consecrated hearth, worn by use of hundreds of worshipers who have left no other trace of their existence. We have a crane, too, in the capacious fireplace, and the seat in the corner window has hinged covers, the space below holding the newspapers and other rubbish which is in the housekeeper's way. In another corner we have a large wood-box. The kitchen and laundry are supplied with hot and cold water.

The morning side of the house this season is the western, commanding a view into the picturesque valley of the Arroyo Seco, and its rugged hills.

Pasadena, Sept. 5, 1883.



CARMELITA—RESIDENCE OF DR. E. S. CARR, PASADENA, LOS ANGELES CO., CAL.



SECOND AND THIRD STORIES OF DR. CARR'S RESIDENCE.

The Engineer.

The Jordan Canal.

The proposed Jordan canal—so called, if the project is carried out—would not be a canal at all, but a large inland sea, some 300 miles long, with an average of from 10 to 15 miles in breadth. The waters of the Dead Sea would be raised from their present level about 1,300 feet, and its area, of course, be largely increased. The river Jordan, the Dead Sea and Lake Tiberias, would all disappear, with some square miles of land, principally on the western side of the Jordan valley as now existing, and in their place would be a vast inland sheet of water, fertilizing the neighboring desert with the rainfall produced by the evaporation from its surface. Not a mere canal would thus be created, but a wide-open channel, traversing Palestine from north to south, navigable in every sense of the term, with safe harbors here and there on either side.

This scheme is by no means a new one. It was proposed, we believe, by the first Napoleon; but now it has attracted fresh interest from the demand for an increase of the facilities afforded by the Suez Canal. The scheme is put forward under the leadership of the Duke of Sutherland. Upon its opening, nearly all the memorial sites of sacred history, Jerusalem, Bethlehem and Nazereth chiefly being excepted, would disappear forever. Capernaum and Jerico; the Jordan and the Lake of Gennesaret, would be at the bottom of the sea. Half the histories of Joshua and Jesus could henceforth be illustrated only from ancient drawings and descriptions; further archæological discoveries in that region would be impossible, though at this very time the Palestine Exploration Fund has plans to excavate in many of the spots to be covered. On the other hand the ships of the world could steam over the place of Elijah's sacrifice; through the scene of so many notable battles, from the time of Deborah, and Saul, and Nebuchadnezzar to those of Richard the Lion-hearted and Napoleon the Great, and so past Gilboa into the new El Ghor; and within three or four miles of Jerusalem itself.

Biblical readers call to mind a singular prophesy, found in the forty-seventh chapter of Ezekiel, which they think would be fulfilled in the event of the completion of this work. If the reader will turn to that portion of the Old Testament, he or she will see how it speaks about bringing out the waters toward the east country into the desert and then down to the sea. It mentions, moreover, the healing of the waters and the appearance of a great multitude of fish. The coincidence of these passages with the details of the Palestine canal scheme is very curious, for the first may be taken to indicate the eastward flow from the Mediterranean through the cutting across the plain of Esdraelon, and thus on by way of the desert to the Red Sea, while the second may be thought to foreshadow the fate of the great Dead Leak of the Scriptures, its waters sweetened by contact with the invading stream, so as to admit the presence in its waters of the various kinds of fish. No other engineering project has ever contemplated such vast physical changes as this.

The Tunnel Between France and England.—Sir John Hawkshaw, civil engineer, recently stated that there were no engineering difficulties in the way of formation of the tunnel between France and England, and that its maintenance would be cheap. He estimated the cost of the tunnel at £8,000,000 and said the work would occupy in construction eight years. He had no doubt as to the financial success of the undertaking. It was reasonable to reckon upon 2,000,000 passengers being carried through the tunnel annually at 6s. per head, and 1,200,000 tons of goods at 5s. per ton. That would produce a revenue of £900,000. Allowing 40 per cent for working expenses, 6¾ per cent could then be paid upon the capital of £8,000,000. As one means of defense, it had been suggested that steps should be taken by which the tunnel could be flooded. He, however, was of opinion that arrangements could be made to throw up a mass of shingle inside the tunnel, and thus prevent its use. If necessary, the tunnel could be blown up. Should more than one tunnel be constructed, the question whether or not they should all be defended by forts was a question for a military man. If there were several tunnels they could be easily defended by the same fortifications on the English side. The tunnel would be 180 feet below the bed of the channel.

Captain Eads' Ship Railway.—Many will, perhaps, be surprised to learn that Captain Eads' much-talked of ship railway across the Isthmus of Tehauntepec has been begun. Captain Eads, having changed the views formerly held regarding the project, has secured ample grants from the Mexican government to permit the prosecution of the work, and ground was broken at the Atlantic terminus of the railway, in the latter part of May, some 150 miles southeast along the Mexican coast from Vera Cruz, almost directly south of Galveston and a little south of west of New Orleans.—*Iron Age.*

Useful Information.

Glass Clothing.

The ingenuity that led to the manufacture of articles of clothing from paper has been eclipsed, as similar articles are now made from glass. An up-town dry-goods store has on exhibition a glass tablecloth several feet square, of variegated colors, with ornamental border and fringed edges. The fabric is flexible and only a little heavier than those woven of flax, while it is claimed that it can be washed and ironed like an ordinary tablecloth. Glass has been spun and woven in Austria for some years, but it is a new undertaking in this country. A prominent glass manufacturing firm of Pittsburg, Pa., recently engaged in the manufacture of this brittle substance into fabrics, which they claim are as perfect, delicate and durable as the finest silk. A representative of this firm said yesterday that they can spin two hundred and fifty nine threads, each ten miles long, in one minute. The weaving is done with an ordinary loom, but the process is more difficult and much more interesting than the spinning of cotton or other threads. "We can duplicate in glass any costume," said this gentleman, "and can make it just as brilliant in color, elaborate in finish, perfect in fit, and equal in its smallest details even to the button on the original. The fabric is very strong, cannot be ripped or torn, and can be sold at a less price than linen, cotton or silk, or other fabric imitated. It is also very warm, easy-fitting and comfortable, whether worn as dress, shawl or other garment in ordinary clothing." Among the articles already manufactured of glass are beautiful feathers, which resemble those of the ostrich: towels napkins and tablecloths.—*Cincinnati Gazette.*

Receipts.

Perhaps the most unsatisfactory things in current scientific literature are the recipes given for making various substances, or for performing various operations. A recipe usually has a great fascination for one who has a little knowledge of the arts; and writers much given to the compilation of books like to produce a recipe book, and the greater the number within the covers the greater is the supposed value. Usually these are composed by men who have little practical knowledge, and a still smaller knowledge of chemistry. The result is a most horrible mingling of old and new chemistry, of directions which were obsolete 50 years ago, and of names which no chemist will now recognize. In general it is safe to say that 90 per cent of the directions given lack that definiteness which is essential to success. Some of them are criminal. For example, not long since many of the scientific papers published directions for etching glass, and without a single word of caution, either in regard to its terribly corrosive qualities or its dangerous fumes, directed their readers to use hydrofluoric acid. Those who know enough to safely handle the acid would also know all about its properties and how to use it for glass etching, and for those who had not this knowledge or experience it would be about as dangerous as giving a pound of gunpowder to a man unacquainted with its properties and remarking that it was combustible. Not long since one of our exchanges suggested that two ounces of pure rubber in thin slices dissolved in a pound of bisulphide of carbon would make a good cement for rubber belting. It adds, if kept long it thickens very soon. Only imagine some one with a leather belt to mend undertaking without further directions to make a pound of cement with bisulphide of carbon. The attempt would probably cause him to abhor bisulphide to the end of his life.

Oil Upon the Waters.

The efficacy of oil to assuage the violence of the waves at sea appears to be now very generally known, and to be becoming appreciated at its real value by mariners. Lately, we are informed by *Chambers' Journal*, the ship *Glamorganshire* was saved in a tempest in the North Sea by the timely use of oil, while a powerful steamer, the *Navarre*, in the same tempest, was overwhelmed by the waves and foundered, on the 6th of March, with all on board. The journal above named is so fully impressed with the importance of this subject, that it remarks that "ships that leave port unfurnished with oil, in case of emergency, are defrauded of one of their chief elements of safety."

The efficacy of this simple agency in stilling the waves of a turbulent sea has been so often spoken of by various writers, that to "pour oil on troubled waters" is a saying that has passed into a proverb. It is not a little curious, however, to notice how seldom its use is resorted to by vessels in distress, although a number of well authenticated cases are recorded which demonstrate beyond the shadow of a doubt that its effect in preventing the waves from breaking about a ship is simply marvelous. The remedy of employing canvas bags filled with oil and suspended in the water over the sides of the vessel is so simple a recourse in case of danger from the violence of the sea, that the mariner who fails to resort to it should be deserving of being called criminally ignorant.

How to Put on a Postage Stamp.—A man can always learn something if he will only look about him. I was at the Postoffice Department the other day, and I noticed an employe busy affixing stamps to envelopes. Every time he moistened the right corner of the envelope and then placed the stamp upon it. I asked him if there was any advantage in wetting the envelope instead of the stamp, and he said: "You notice that I moisten the envelope first; well, I do that because it is the right way. There is a right and a wrong way to everything, and, consequently, there is a right and a wrong way to put on postage stamps. It is impossible to moisten a stamp with the tongue unless a small proportion of the gum adheres to it. Now this gum is by no means injurious, but then the department do not advertise it as a health food, so the only way left is the right way, and that is to moisten the envelope first." After listening to this brief statement, I felt as though I had emerged from the deep shade of ignorance to the glorious sunlight of knowledge.—*Washington Letter.*

Barrel Hoops by Machinery.—Hoops of the half round shape, made from stout saplings, are in great demand. An expert cooper can make between 300 and 400 of these hoops in a day; and when it is considered that Chicago alone uses over 200,000,000 yearly, the necessity of some rapid method of manufacture exclusively by machinery is apparent. After repeated failures by all who have endeavored to overcome the difficulties incident to the construction of a hoop-making machine, the barriers seem to have been surmounted by a couple of Bostonians, whose invention, lately completed, makes from 20,000 to 30,000 half-round hoops a day, cutting two, three, or four from a pole, as occasion requires. This branch of barrel making is thus placed on a level with all the others in which machinery is the principal agent of construction. One of the results of the introduction of this new machine will be the utilization of ironwood saplings for hoops. This tough and almost indestructible wood, which easily resists the tools of the cooper, is handled without difficulty by the Boston hoop-making machine.

Wood pavement is to be given up in London. It has not only failed to realize the promised advantages, but has led, according to Prof. Tyndal's report, the serious affections of the eyes and lungs. By continual watering the wood became saturated with the nastiness of the London streets, and then, under the influence of the hot sun, gave forth a species of dust which was pernicious. The old McAdam system is to be restored.

Good Health.

Sick Headache.

Sick headache is sickness at stomach, a tendency to vomit, combined with pain in some part of the head, generally the left side. It is caused by there being too much bile in the system, from the fact that this bile is manufactured too rapidly, or is not worked out of the system fast enough by steady, active exercise. Hence, sedentary persons—those who do not walk about a great deal, but are seated in the house nearly all the time—are almost exclusively the victims of this distressing malady. It usually begins soon after waking in the morning, and lasts a day or two or more. There are many causes: the most frequent is derangement of the stomach by late and hearty suppers; by eating too soon after a regular meal (five hours should, at least, intervene); eating without an appetite; forcing food; eating after one is conscious of having had enough; eating too much of any favorite dish; eating something which the stomach cannot digest, or sour stomach. Any of these things may induce sick headache; all of them can be avoided.

Over-fatigue, or great mental emotion of any kind, a severe mental application, have brought on sick headache of the most distressing character in an hour. It is caused by indulgence in spirituous liquors. Decayed teeth are a frequent cause of the severest form of sick headache, through irritation of the nerves, and blood poisoning from the ulcerated teeth.

When a person has sick headache, there is no appetite; the very sight of food is hateful; the tongue is furred; the feet and hands are cold; and there is a feeling of general discomfort, with an utter indisposition to do any thing whatever.

A glass of warm water, into which has been rapidly stirred a heaping teaspoonful each of salt and mustard, by causing instantaneous vomiting, empties the stomach of the bile or indigested sour food, and a grateful relief is often experienced at once; and rest, with a few hours of sound, refreshing sleep, completes the cure, especially if the principal part of the next day or two is spent in mental diversion and out-door activities, not eating an atom of food—but drinking freely of cold water or hot teas—until you feel as if a piece of plain, cold bread and butter would "taste really good." Nine times in ten the cause of sick headache is in the fact that the stomach was not able to digest the food last introduced into it, either from its having been unsuitable, or excessive in quantity.

When the stomach is weak, a spoonful of the mildest, blandest food would cause an attack of sick headache, when ten times the amount might be taken in health, not only with impunity, but with positive advantage.

Those who are subject to "sick headache" eat too much and exercise too little, and have cold feet and constipation. There is also, in a majority of cases, neuralgia of the face caused by decayed teeth, or ulceration at the roots of teeth that appear to be sound. When this is the case there will be no permanent relief, while life lasts, without the assistance of a competent dentist. But where the teeth are not at fault, a diet of cobl bread and butter, and ripe fruit or berries, with moderate continuous exercise in the open air sufficient to keep up a very gentle perspiration, would of themselves cure almost any case within thirty-six hours. Two teaspoonfuls of pulverized charcoal, stirred in half a glass of water and drank, generally gives prompt relief.—*Journal of Health.*

Dangers from Impure Water.

Too much reliance is placed on the senses of taste, sight, and smell in determining the character of drinking water. It is a fact which has been repeatedly illustrated that water may be colorless, tasteless, and colorless, and yet be full of danger to those who use it. The recent outbreak of typhoid fever in Newburg, N. Y., is an example, having been caused by water which was clear and without taste or smell. It is also a fact that even a chemical analysis sometimes will fail to show a dangerous contamination of the water, and will always fail to detect the specific poison if the water is infected with discharges of an infectious nature. It is therefore urged that the source of the water supply should be kept free from all possible means of contamination by sewage. It is only in the knowledge of perfect cleanliness that safety is guaranteed.

The local European volunteer health commission in Alexandria, where the cholera has been raging along back, is unearthing, according to the *Sanitary News*, some very unsanitary conditions in that city. They have found a large native cemetery, underneath which runs a canal with which communicates a well, the water of which is used to wash dead bodies.

A drinking fountain adjoins this well, and the canal is the water supply of a crowded portion of the town. In the mosques are stagnant pools of water used for ablutions prescribed by religious belief, the water in which, being unchanged, gets indescribably foul. Such nuisances are difficult to abate, because of religious prejudices. Is it any wonder, adds the *News*, that pestilential disease attacks such a locality?

Precaution Against Consumption.

Dr. Arthur Ransome, in his Manchester Health Lectures, says:

Let me, then, urge again upon you the importance of thorough and sufficient ventilation of your living rooms. Avoid crowded omnibuses or railway-carriages in which the windows are closely shut, or in which the ventilation is so small that it does not prevent the condensation of vapor on the windows. Above all, do not frequent crowded meetings in which the organic exhalations are pent up within four walls. Remember, too, that the danger is especially great wherever there is a continuously high temperature. Professor Koch tells us that the limit of temperature within which the baccilus can be cultivated is from about 86 degrees to 107 degrees Fahr., about the heat of a hot summer's day. The continuously high temperatures in which formerly our consumptive patients were condemned to live was the very worst condition with which to surround them. Consumption is a much more rapidly fatal disease in hot than in cold climates, and it is probable that it is more truly infectious. The Indians treat it as if it were almost as infectious as scarlet fever or measles, and we must ascribe its less prevalence there to the almost open-air life the inhabitants lead. The evil practice of heaping upon the bed at night the clothes that have been worn in the daytime, or even as some do, of wearing the same underclothing day and night, is most pernicious, and likely to breed consumption in those who live in houses where this practice is pursued.

"Doctoring" Farm Animals.—It is poor practice to be continually dosing animals. When we see a farmer frequently visiting the drug store for medicine for his stock, the impression is that there is something radically wrong in his management. He is the "sick one," and needs the aid of a good physician—some one to show him that the sickness rarely happens on a well-ordered farm; that clean, warm stables and plenty of good feed, pure water in abundance, etc., are far better than their opposites, with all the physic that the largest drug store can supply. Nothing is more clearly proved than the importance of care and keeping of the right sort for the health of the farm animals and their profitable growth and increase. Sickness will sometimes come with the very best management; and when it does, it is better to employ skilled hands to cure, than to "doctor" and "physic," and perhaps kill the valuable animal yourself, which under proper treatment might have been saved at a trifling expense.—*Agriculture.*

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SAN FRANCISCO:
Saturday Morning, Oct. 6, 1883.

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Passing Events.

The disastrous fire at Pittsburg which destroyed the exhibition building with its valuable contents, including the first locomotive ever run in the United States, was very greatly to be regretted. It will doubtless exercise an influence on future exhibitions, for possibly it will make people chary of allowing valuable and rare articles to be exhibited.

The first rains of the season have fallen since our last number went to press. The water fell over nearly the whole state.

The great debris suit is being argued in this city still, and miners are impatiently waiting for a decision on the subject.

There is little to note from the mines of late of any special moment. The current news we give elsewhere.

ACCORDING to Magee's *Real Estate Circular*, there were 181 sales of real estate in this city during September, aggregating $947,773. The same authority gives the number of mortgages during the same period at 170, amounting to $1,064,592, and of releases at 190, representing $1,138,989. The paper adds: "All of the savings banks report a glut of money with little or no demand. Rates are six per cent at the Hibernia, while all the rest of the savings banks are asking seven per cent."

THE Cannon Ball train on the Atchison, Topeka and Santa Fe road was attacked at Coolidge by a gang of cowboys Saturday. The engineer was killed and the fireman so badly injured that he will die.

THE Oroville *Register* gives currency to a report that Governor Stanford offered General Bidwell a million and a half for his Chico ranch, which was refused.

A New Reverberatory Furnace.

A reverberatory furnace for smelting purposes, which will burn liquid fuel has just been patented through the MINING and SCIENTIFIC PRESS PATENT AGENCY, by John H. Canavan, of Globe, Arizona. The floor of the furnace is preferably inclined and is made oval in shape. When fifteen feet long it would be 9 feet in the greatest width, and five feet wide at the front and four feet at the rear end. Around the sides is a boiler-iron water-jacket which extends up to the crown, or about two feet, while the remainder of the height (about three feet) is filled in with clay and coke-dust. Openings are left through the water jacket for slag-taps. The bottom may be of fine quartz or sand. Across the front are tuyeres which receive air from a wind box, supplied by a blower.

At the proper height are placed oil-tanks from which pipes lead down and have discharge pipes entering the tuyeres a short distance so as to deliver the oil at a point from which it may be carried into the furnace by the blast, thus producing an intense heat. The crown of the furnace is of asbestos or brick, and has two passages through which ore is fed into the furnace. This furnace is adapted for melting ores of copper, lead, and silver, and is operated as follows: The inside of the furnace is lined up from the bottom with common clay. About five bushels of charcoal are put in and fired. The blower is started and the oil turned on, and in a few minutes afterwards the charge is let down. In about three hours the clay lining will be destroyed, and its place taken by a coating of slag about half an inch thick all around the jacket, which prevents the chilling of the remainder of the contents of the furnace. The slag-tap opens into the furnace about two inches below the top of the water-jacket, and is kept open, so that slag will be running all the time when the furnace is in blast, there being a slag well on the outside.

The furnace will thus be kept full of slag to within two inches of the top, the charges of ore being let down at intervals into the molten slag and copper, there being added about five per cent of charcoal to deoxidize the metal. When sufficient metal has accumulated in the furnace, say 500 pounds, it may be drawn off into molds through the opening.

A furnace of the size described is capable, Mr. Canavan asserts, of reducing from 90 to 150 tons of ore in 24 hours. A main stop valve controls the flow of oil from the tank, and each tuyere has also a valve by which it may be cut off or regulated independent of the others. With this arrangement the heat in the furnace may be raised in a few minutes from 500 to 4,000 degrees.

This mode of supplying air and oil may also be supplied to brick furnaces by having the tuyeres and wind-box set on the outside of the brick, or it may be applied to melting or heating furnaces in copper or in rolling mills.

Hoisting Cables.

The cables commonly employed in the hoisting works of our deep mines are either flat ropes of steel or iron wire, or heavy round hemp rope, though the latter have been generally displaced for the metal. Chain is rarely used. Flat ropes were generally preferred, especially for great depths, because they possess greater strength in proportion to their size, winding themselves compactly on a reel and withstanding the wear and tear of the work well. They are usually from 3½ to 5 inches wide, and vary in thickness somewhat. If of iron wire they are from one-half to three quarters of an inch thick; if of steel, but three-eighths. The latter is preferred on account of its lighter weight and less bulk as well as great strength. Flat ropes are wound on narrow reels the width of which is but little greater than that of the rope. The latter therefore winds upon itself at each revolution of the wheel. The cable passes from the reel or drum over a sheave which is supported directly over the shaft, and thence downward into the mine. The sheaves are made of wood or iron of various dimensions Those of large diameter are preferred as they cause less wear and tear on the fibre of the cable.

THE City Council of Los Angeles has voted down the ordinance to license gambling by a unanimous vote.

Mining in Northern Arizona.

Since the completion of the Atlantic and Pacific railroad a new impetus has been given to mining in Northern Arizona, valuable lodes carrying high-grade ore have awaited its completion several years. Prior to the building of this railroad the want of rail or water transportation was much felt, the charges for carriage by available means being so high as to leave but a small margin to shippers, even on high-grade ores, and ores of average grade could not be mined and shipped except at a loss. This has been the cause of the backwardness in the development of this section, many owners preferring to let their property lie idle and wait for the Atlantic and Pacific railroad with its attendant lowering of rates on ore and supplies.

Many properties are now being brought into condition for the resumption of ore shipment. The holders of several of the large copper mines as well as the owners of high-grade silver-bearing veins along the line of the railroad will now avail themselves of the improved facilities.

The McCracken and Signal mines, of Owen's district, tried the experiment of reducing ore under the old expensive methods; but, while the mines produced several hundred thousand dollars, heavy expenses incident to their remoteness consumed what would, under the present conditions, have yielded large returns to the stockholders. The same experiment was tried on a smaller scale with the high-grade ores of the Arnold and the Hibernia mines of Cedar valley. Now that a handsome profit can be realized by mining and working, or by selling the ores, these properties are being put in shape for production, the latter mine having new life infused into it through the medium of Eastern capital.

Certainly nowhere in Arizona does a better field present itself than in this now accessible portion of the territory. The ledges are large, ores of high assay value, and wood and water abundant. But for the drawback before alluded to, the bullion product would have spoken for itself; and happily for the long-patient holders of the other mines, it is a thing of the past.

Institute of Mining Engineers.

The American Institute of Mining Engineers is a "live society," and its frequent meetings of late serve to bring out a great deal of valuable information in the possession of the members. Within the past few years more attention has been paid to mining outside of coal and iron, as the precious metal mining field has been more occupied by Eastern investors. We have published a number of the papers read before the Institute, and have others ready for publication.

The autumn meeting of the Institute will be held in Troy, N. Y., and will commence on Tuesday next, continuing four days. During that period they will visit the Clinton Stone Foundry, Rensselaer Merchant and Rail Mills, works of the Burden Iron Co., Albany Iron Works, Bessemer works of the Albany Co., the Hudson River Ore Co.'s property, etc.

The visits and excursions are only incidental to the business meetings. The papers read are published and sent to members, so that a great deal of information of value is disseminated. The following papers have been announced for the forthcoming meeting:

"The Law of the Apex," by Dr. R. W. Raymond, of New York. "Some Notes and Tests of an Open-hearth Steel Charge made for Boiler Plate," by A. E. Hunt, of Pittsburgh. "The Ste. Genevieve Copper Smelting Process," by Frank Nicholson, of Ste. Genevieve, Mo. "A Description of a Chemical Laboratory erected in 1863, as an adjunct to the Experimental Steel Works at Wyandotte, Michigan," by W. F. Durfee, of Bridgeport, Connecticut. "Some Canadian Iron Ores," by F. P. Dewey, of Washington, D. C. "Notes on an Experimental Working of Silver Ores by the Leaching Process," by J. H. Clemes, of Sonora, Mexico. "Determination of Manganese in Spiegel," by G. C. Stone, of Newark, N. J. "Pyrites of Louisa County, Va.," by W. H. Adams, of New York. "A Systematic Nomenclature for Minerals," by H. M. Howe, of Boston. "The Bessemer Plant of the North Chicago Rolling Mill Company at South Chicago," by R. Forsyth, of Chicago.

AN almost inexhaustible supply of water has been found by digging at Independence, on the Carson and Colorado Railroad.

The Cable Railroad System.

We have in preparation and will shortly publish, an elaborate description of the latest and most improved of our local cable railroads. A number of engravings now being made will serve to illustrate the whole subject very fully. We have been at considerable trouble to obtain all the details of construction of road, cars, machinery, etc., so that the description will be of utility to engineers. The Market-street cable railroad is the most complete of the kind in the world. In this city, where this system of street-car propulsion by underground cables was originated and has been fostered, we have had a great deal of experience, and all of this experience is combined in the new road, together with many improvements not before adopted.

The engravings which we have lately been giving in the PRESS, and those in preparation, are of a character to show that we endeavor to present in attractive form all the subjects which will interest our readers. The forthcoming edition will be very fully illustrated. It will be published as soon as the engravings are completed.

The cable railroad system is now rapidly extending. They have it in Chicago, and several other large Eastern cities will soon adopt it. All matter pertaining to the system is therefore of great interest. Our forthcoming description will be of such a character as will render it valuable for reference on the subject. The engravings will all be new, be well executed, and will include many details as well as general views.

Many persons are under the impression that all cable railroads are controlled by certain patentees, or rather that the general system is patented by some few persons. This is not so by any means. The patents so far granted are for many devices, and no one patent covers the idea of cable railroads. There are a dozen or more grips, for instance. All the patents in existence are for improvements on cable roads. Most of the railroads here are operated under the Hallidie patents. The Market-street railroad uses none of these, however, most of the improved appliances having been invented and patented by Henry Root, Superintendent of Construction of the road. An agreement exists between Mr. Root and the Market-street Railroad Company by which they have the use of all his patented devices and systems, and they hold license from no other persons.

The Water Balance.

There are some places where water-balance machines can be used for hoisting ore from mines. In many of the open works of the great coal basin of South Wales, water-balance machines are largely used for mining purposes, and for mines not more than 100 fathoms deep. In a district where there is plenty of water and free drainage they will work very well. Sometimes they are used where there is no drainage, the water being pumped up again by a pump, but this is of course not economical.

The car is placed in a cage over an empty water bucket, and the empty car on a similar bucket at the top. Water is then made to flow into the upper bucket until its weight is great enough to cause it to descend, so raising the loaded car. On the arrival of the full bucket at the bottom a self-acting valve opens, and the water is discharged, so allowing the process to be repeated. The buckets are made of half-inch boiler plates, circular in form, and hold about two tons of water. The landing chain is balanced by a chain which hangs below each bucket, and guide chains are used to keep the buckets from striking each other when the shafts are not divided. A speed of 300 or 400 feet per minute is easily attained by this machine. For great depths the weight of the machinery becomes so great that the apparatus is no longer economical. Machines somewhat similar in character are used in some of the iron mines of North Lancashire and Cumberland.

THE Creighton herding cattle ranch, the largest with the exception of the Swan outfit on the northern ranges, has been sold to the Bay State Live Cattle Company for over $700,000. The ranch and ranges are located near the line between Nebraska and Wyoming.

WITHIN a year the value of Oakland manufactures has risen from $2,798,000 to $4,654,500, and the number of employees has increased from 973 to 1,872 within the same period.

Earthquake Waves.

Although a number of earthquakes have occurred in California since it has been settled by Americans, none of them have been of such a character as to cause serious loss of life; and with none of them have we ever had a tidal wave. Where great earthquakes occur at or near a coast line, there is generally a resultant tidal wave of greater or less height. These waves do not necessarily occur at the moment of the shock, but may appear an hour or more afterwards. We have in this harbor an instrument for recording the height of waves, and its arrangement is such that it records earthquake waves also, and in such a manner that their presence is always detected, even when the earthquake occurs in South America, Japan, Java, or other places at great distance away. This self-recording gauge is maintained by the U. S. Coast and Geodetic Survey, and at the last meeting of the California Academy of Sciences Prof. George Davidson described its construction and operation, and exhibited diagrams of the markings.

The subject is one of considerable interest, and is one little understood by the general public. The gauge not only records the rise and fall of the tides, but the presence of unusual waves on the bar at the Golden Gate, as well as earthquake waves. A properly ruled sheet of paper is moved along by well regulated clock-work, so that about an inch of paper passes a given point in an hour. During this time a lead-pencil point impinges on the paper. This pencil is actuated by wheels connected with a peculiar float on the surface of the water. The pencil moves across the paper one inch to a rise of one foot of the sea. The box containing the float is so arranged that ordinary small waves do not affect the record of the pencil. At a point below the lowest level of the float there are holes in the box, to admit free movement of the water and give the level of the sea, regardless of small waves in the harbor or in the offing. When there is a heavy sea, part of the holes are closed.

There are some curious phenomena exhibited by this gauge, or rather brought to light by it, at the "slack" of each high and low water, depending on the characteristic of the entrance of a harbor. If an entrance is "throttled" or narrowed as it is in San Francisco, the incoming flood tide will have to force its way against an ebb running six knots an hour. To do this the young flood must come in along the bottom like a wedge and widen out. It must lift the whole outward moving mass over it. The recording pencil of the gauge shows this rise at the slack water. But this water wedge is soon overcome by the outgoing volume, and spreads out, so a slight fall then takes place. The pencil records this too. These changes occur at each high and low water.

There are tides which occur in this harbor where the fall from the "small high" to the "small low" is only about a foot, and sometimes even less; but a neap tide will run down to six or seven inches only.

Ordinary waves are not registered by the apparatus described. With a breaking bar, however, the gauge takes up the register, and in addition to the usual tide curve inscribed by the pencil, a serrated or "jigged" line is made, indicating this wave action. On the register this is very plainly marked. It will record the impulses of great breakers on the bar of San Francisco, and will also record impulses which have even a longer line of movement where the level is sustained for more than three minutes, so the float will be lifted.

As early as December 25, 1854, earthquake phenomena were recorded here, and waves were recorded constantly to the 1st of January following. There were no telegraphic or quick means of communication with the East or with South America or Japan in those days. The Coast Survey sent word to Washington about the disturbances, saying an earthquake must have occurred at some distance from here. It was not until the following June that this was corroborated. The waves rose 0.65 of a foot at San Francisco, and they were recorded also at San Diego and Astoria.

In 1868 the Arica (Peru) earthquake occurred, on which occasion the United States steamer *Wateree* was lifted by a wave forty feet high and carried far inland. These waves were propelled to these shores, and were recorded here. One was two and one-half feet high, but they averaged eighteen inches. They had to travel 4,500 nautical miles to reach San Francisco. The wave motion continued for six or seven days, though at Arica the tidal wave continued but seven hours. The only explanation of this is, that the waves carried across the Pacific were reverberated, and returned again several times before subsiding. The same wave would travel over to the Australian or Japanese coast, and come here from there again, crossing the ocean several times.

At the time of the earthquake at Arica there was no change in the surface of the water for 30 or 40 minutes, and then the great waves began to come and go. There were five great waves in the Simoda (Japan) earthquake of 1854, but seven or eight came to us here; so there must have been two reflex waves. So in Arica in 1868, the waves came here, one two feet high, and averaging one foot. They came at intervals of 35 minutes; and in addition to the main waves, inferior ones were recorded.

In 1877, while the gauge was smoothly recording the low water of May 10th, it began also to record earthquake waves from an earthquake at Iquique in South America. At the time of this great earthquake, at the Chincha Islands there was no motion of the water for some time; but late in the evening the water began to recede, and the people saw bottom where a short time before there were 100 feet of water. The wave on the main shore was 65 feet, so the center of the turbulance was off at sea somewhere. Our gauge here showed a rise of one foot. For several days there were waves, some as high as 17 inches, and some very well marked high crests. The interval between the crests of the waves was 45 to 50 minutes.

On the 27th of last August, at 2 A. M., the local gauge began to record earthquake waves. At noon the average height of the coming waves was about one foot. This motion continued for three days. The markings were, however, less characteristic than those of 1868 or 1877. The reason of this was, in a great measure, that so many obstacles intervened between this port and Java, where the earthquake occurred, the waves passing through narrow straits to get to the ocean. The distance from San Francisco, on great circle, to the northwest part of Java, where the center of the shock occurred, is 8,960 miles.

When the time of the original appearance of the wave at the central point is known, the average depth of the ocean between this point and that can be told. The rate of progress bears a certain relation to the depth of water. The Simoda earthquake waves had to travel 4,500 nautical miles, and they came in twelve hours and thirty-eight minutes. The velocity was 358 miles per hour, or 6 miles a minute.

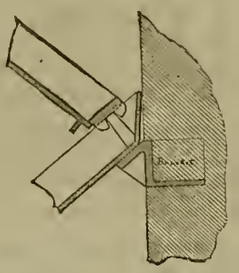
Ariy has shown that in what is called the free ocean, where the water is 2,230 fathoms or more, a wave traveling that distance should reach this shore in the above time.

This agrees with the soundings made by Commander Belknap on the Tuscarora in 1873. There is a plateau of 2,200 fathoms deep running from this shore nearly to Japan, deepening somewhat as it nears that coast.

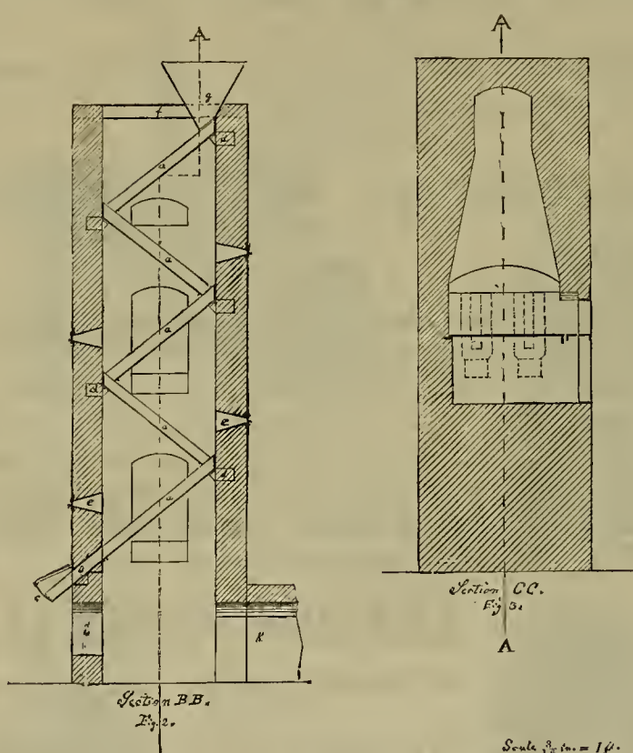
In the Arica earthquake of 1868 the wave ran 4,480 miles. It was attempted to deduce from its speed the depth of ocean, but several features presented themselves which prevented fair deductions. Thus the deduced depth to San Francisco was 1,800 fathoms, but it is known that the plateau is 2,200 fathoms.

From Ariea to San Diego the depth on the average is 2,713 fathoms. Coming north of San Fiego the change in the trend of the coast line and the interference of the Santa Barbara Islands acted as obstruction to free movement of the great wave, and thus retarded it. In a short time we will present graphical representations of these earthquake records, as well as those of the regular tidal waves; and of the breaking Bar waves.

San Joaquin county has accepted the offer of the Central Pacific Railroad to compromise the tax suits. The basis of the offer is the surrender to the said county of its bonds for $100,000, with accrued interest thereon, and the payment to the said county of $300,000 in gold coin.



Interlocking of Shelves.



STETEFELDT'S SHELF DRY KILN--See Page 209.

Foundry Notes.

The San Francisco Brass Works.

Among our home industries which have made rapid progress of late is that of the manufacture of brass goods, and more especially those which are used by the plumbing trade. Until within a comparatively short time almost all the plumber's material has been imported for this coast. When Joseph Roylance started in, some eight years ago in a very small way to make his castings, without any capital at all, he had little idea that the branch he had undertaken would grow to such dimensions as it has since. After going along on a small scale for nearly eight years, William Moller joined the firm, and property was bought on Mission street, Nos. 413 and 415, and the original buildings, etc., were very much enlarged. After these two had run the business for a while, Robt. Dalziel, of Oakland, came over and consolidated the business, which then became a manufacturing and jobbing one.

The establishment is known as the San Francisco Brass Works, and has abundant capital, working from 90 to 100 men continually. They make all kinds of brass goods for plumbing and water works. They are the sole manufacturers in the United States of the "X" steam cock and globe valve. This is made of a metal far superior to any steam metal in the United States. They also manufacture the oxidized bronze, which is used for journals, being the hardest of metals. The Pacific Mail Steamship Company foundries, etc., use this and it is pronounced superior to phosphor bronze. There are only two other places in this country where they make this. They have just started this kind of manufacture here. A very large stock of iron pipe and pipe fitting, for water, gas and steam, are constantly on hand. Among other goods are sinks—black, enameled, galvanized and marbleized. Also, water closets, plumbers' earthenware, and in fact every article pertaining to a first-class plumbers' supply headquarters. A strong speciality is in iron pipes and fittings, it being the intention to keep the largest and best stock of these goods on the coast.

The establishment is quite a large one. The basement is filled to overflowing with the heavier goods, such as pipes, etc. The two-story building above has every inch of room occupied, and more space is so much wanted that a new and third story is shortly to be added. The lot is 40x160, covered with the building, and there is a foundry in the rear. The foundry is adapted to make three heats, or 210 boxes a day regularly. Up stairs, in the finishing room, are all the necessary appliances for finishing the various castings. Every article made is carefully tested, so as to stand certain pressure without leakage. The manufacturers can therefore guarantee all their work as perfect in every respect.

This is a home manufacture which is equal to any in the United States of its kind. The managers are practical men, and with the experience of Mr. T. W. Jeffress, who was for a number of years employed by W. W. Montague & Co., of this city, and who has a thorough knowledge and knows the wants of the trade on this coast, they can not but continue to succeed. The success which they have met with is proven by the gradual and constant increase of business, and necessity of enlargement of the works. No very large castings are made, the work being confined to that class of articles used in the plumbers' trade, such as cocks, valves, faucets, fittings, etc. They now keep all the supplies needed for first class plumbing stock.

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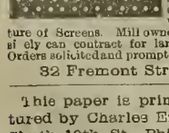
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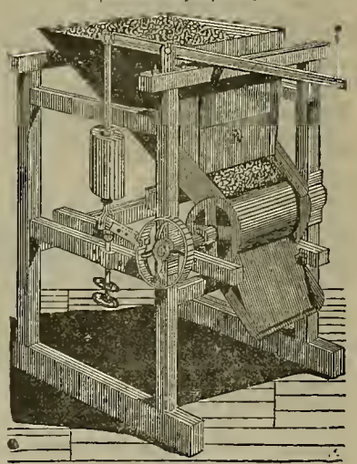
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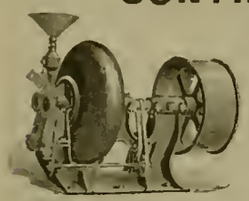
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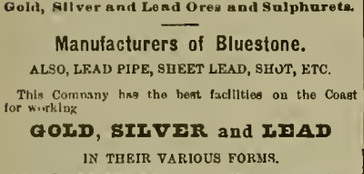
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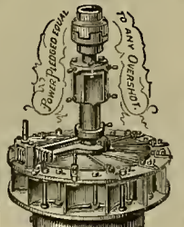
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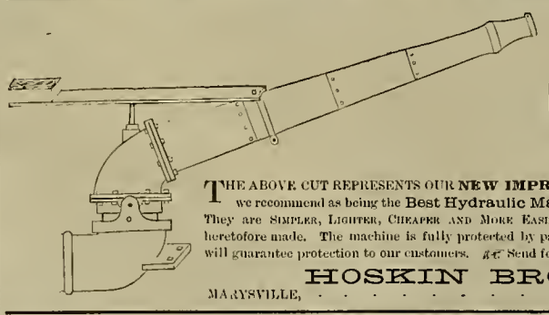
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LAND Good land that will raise a crop every year. Over 12,000 acres for sale in lots to suit. Very desirable Fruit, Vine, Grain, Vegetable, Hay, and Pasture Land. Near Railroad and Sacramento river; $3 to $30 per acre. Wood and water convenient. U. S. Title perfect. Send stamp for illustrated circular, to EDWARD FRISBIE, Proprietor of Reading Ranch, Anderson, Shasta Co., Cal

INVENTORS. L. PETERSON, **MODEL MAKER,**

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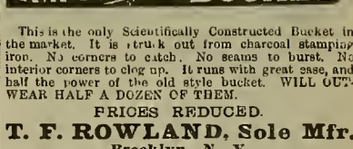
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These Superior Oils *cannot* be purchased through *dealers* and are sold direct to *consumer only* by H. H. BROMLEY, sole dealer in these goods.

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THE BEST IN USE!



This is the only Scientifically Constructed Bucket in the market. It is struck out from charcoal stamping iron. No corners to catch. No seams to burst. No interior corners to clog up. It runs with great ease, and half the power of the old style bucket. WILL OUTWEAR HALF A DOZEN OF THEM.

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H. P. GREGORY & CO., Agents, San Francisco, Cal., carry a stock of all sizes.

PACIFIC POWER CO.

Room with steam power to let in the Pacific Power Co.'s new brick building, Stevenson street, near Market. Elevator in building. Apply at the Company's office, 314 California street.

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ROCK DRILL!

FOR MINES, QUARRIES, ETC.

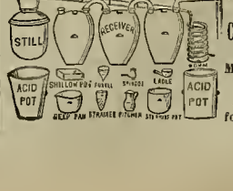
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RICHARD C. REMMEY, Agent,

Philadelphia Chemical Stoneware Manufactory,

1100 East Cumberland St., PHILADELPHIA, PA.



Manufacturer of all kinds of **Chemical Stoneware** —FOR— Manufacturing Chemists.

Also Chemical Bricks for Glover Tower.

Machinery at the Fair.

While the display in the mechanical department of the Mechanics' Institute Fair, now in progress in this city, should have been much larger, in view of the many foundries, machine shops and factories in this community, there are yet a number of things to interest one, and several of the displays are very creditable. Mining machinery is by no means plentiful, for instance, yet we make plenty of it, and of all kinds in this city. Among the mechanical appliances of mining on exhibition is

Tustin's Ore Mill,

A machine which we described and illustrated not long since. Mr. Tustin shows his mill in operation, so that any one can see how it works, and the result. He is just shipping one of these machines to the Oro Plata milling company, at Murphys, Calaveras county. They had one of the small ones a long time, and then purchased three of the large ones. These have given entire satisfaction, and a few weeks ago they ordered another large one. They say they have no more use for stamps. The stamps "slime" up to forty-eight per cent, and the pulverizer makes only about six per cent of slime, which makes the difference between success and failure in their operations. They own a ten-stamp battery, which, however, they have hung up. Mr. Tustin has made some improvements on this pulverizer lately. By a simple means of regulating the throw of the feeding apparatus, the rate of feed can be ganged to the utmost nicety. The machine is quite a strong and durable one. Mr. Tustin also exhibits a small rock-breaker, which is made to be sold at a low price, but is simple and strong in construction. It has the rubbing and crushing motion, both so essential in these machines. The Joshua Hend. Machine Works exhibit

A Triumph Concentrator.

This machine we recently described, and mentioned the new features which have been combined with it. The manufacturers inform us that one is now being put into the Empire mill, at Grass Valley, where there will be a competitive trial of this with two other prominent forms of concentrators. The mill is being remodeled, and the owners will put in the best machines. Several of these concentrators have been ordered lately for Arizona and New Mexico. The improvements recently added to this machine very materially add to its efficiency.

The Ohmen Engine.

The display made by the manufacturers of the Ohmen engines is quite creditable. Twelve different engines are shown, from four inches up to twelve inches; some upright and others horizontal, and some with plain slide valves and others with the Meyers cut-off. One of the engines has a new automatic cut-off, a patent for which has been filed. The makers claim the new engine will work as economically as the Wheelock or Corliss.

The ore which has been tested has answered every expectation, and is a grand success. There are few parts to wear out. Mr. W. H. Ohmen and his foreman, J. Simmons, are the designers of the new style engine. The slide valve and Meyers cut-off engine made by Mr. Ohmen are very strong indeed, and will stand rough usage. They are made as strong as possible to accommodate the requirements of this market. The hoisting engine exhibited is the same type as one they have running over at the new wharf of the South Pacific Coast Railroad Company. There are different kinds there, and the engineer tells Mr. Ohmen that his does the best work. There is a small horizontal engine running the four electric lights outside the pavilion. It was furnished free to run lights during the fair.

These works were started in this town about six years ago, with a capital of $600. They would not sell out now for $100,000. They carry a stock of some $35,000, and have a very good and increasing business. They show as much advance as any machine shop in this city ever did. The types of engine made have given good satisfaction.

The Dyer Cannon-Ball Quartz Mill

Is a machine patented about a year ago, and not long since described in the PRESS. An engraving of it appears now in an advertisement in another column. It is simple, compact and strong, and has no complicated machinery to get out of order; the wearing parts are cheaply and easily renewed. Its movement is rotary, crushing (not grinding) either wet or dry equally well, and running in either direction. Will crush according to power used; readily geared for steam, water or horse-power, and can be run by hurdy-gurdy wheel on pinion shaft, which is a favorite method. Occupies but little space. Is quickly set up and removed, and can be placed on any sidehill where there is ten feet of level ground. It will take good sized quartz, dispensing with rock-breaker where it is an object and necessary. It leaves the gold bright and easy to amalgamate, and can be cleaned up in a few minutes. The discharge is ample, and but little wear on the screen, no coarse quartz coming in contact with it. The machine is adapted to either upright or flat screen, as desired, or according to the work required to be done. The cost of the frame is very little, and it can be constructed by any one at the place where used, thereby saving freight and packing.

This machine is made at the Globe Iron Works, in this city. The one exhibited at the fair will crush a ton a day with a No. 40 screen, It weighs twenty-five tons, and will crush wet or dry. One of these machines is at work in the Tom Greene mine, in Shasta County; one in the Drury mine, Placer County; three at Grizzly Flat, Eldorado County; one at Grass Valley, and one at Gold Hill, Nev. One just built is ready to ship now. It is a three-ton machine, and will be run by horse-power. It is going to a mine owned by Chas. Daily, Madera, Fresno County.

Baker's Mining Horse-Power.

This machine, made here by the Pacific Iron Works, we illustrated a short time ago. One of them is exhibited in the fair. The machine is made entirely of iron, and is therefore very durable, and will not be affected by exposure in dry or wet climates. The hoisting drum is completely under the control of the man at the shaft landing the bucket by operating the levers at hand, and by which means the drum can be thrown in and out of gear at will, or the bucket lowered by the brakes as safely and conveniently as by a steam-power hoist. The brake and clutch levers are provided with spring latch and quadrant, giving the man in charge freedom of movement when the brake is operated, and locking it so firmly as to prevent the possibility of accident. The drum will carry 500 feet of five-eighths steel rope, and, running horizontally, will take up and pay out without friction. The drum working independently, a pulley may be put on the end of the drum shaft (which has a projection for this purpose) and connected by a belt to a crank shaft on gallows frame, by which a pump or blower may be run continuously, without interfering with the hoist, as the drum clutch can be thrown in and out of gear while running—an invaluable attachment, and embraced in no other hoist of the kind. This machine will hoist fast. At the ordinary speed of a horse, a 1,000-pound bucket of ore or water can be raised at the rate of 120 feet per minute. Two horses can be used for heavy work, in which case an extra sweep will be required. It is a very light and compact machine; no piece weighs more than 250 pounds, thus admitting of its being packed on mules to all inaccessible localities. The cost of erection is very little, two men in half a day being able to put it in place, ready for work.

Beckett's Engine.

Mr. F. G. Beckett, manufacturer of vertical and horizontal engines and boilers, shows several of the types of his make. The vertical engines and boiler are connected together on a substantial iron base, occupying little space; may be easily mounted upon wheels, rendering them well adapted for agricultural purposes, or can be placed with perfect safety on a boarded floor, the insurance companies making no extra charge for their use. They are very simple in their construction, and easily managed, and can be run with safety by persons of ordinary intelligence. The combined engines and boiler (except the two, three, and four horse-power) are all supplied with heaters, through which the feed-water, by contact with the exhaust steam, passes to the boiler at a boiling point, making a large saving in fuel. The working parts, such as piston rod, valve rod, crosshead pin, etc., are made of steel; the bearings are made of extra length. The crosshead is fitted with brass gibs, having a very large area of wearing surface, being more than two thirds of the stroke of piston. The vale rods work in substantial guides; the balance wheels are of ample size and weight, and turned true for driving belt. Mr. Beckett has one 10x12 engine of twenty horse-power running the saw mill in the fair. He has also one seven-inch engine of twelve horse-power running the turbine pump for irrigating, lifting 100,000 gallons of water an hour. Another one of his engines of five horse-power is running the S. F. Tool Company's blower for blowing air into mines or furnaces. Mr. Beckett is now engaged in making a seventy horse-power horizontal engine, fourteen-inch cylinder, for a flour mill. These engines are well built in a substantial manner. The manufacturer is making a number of them of various sizes.

The Roller Ore Feeder,

Made by the Golden State and Miners' Iron Works, was illustrated in the PRESS in November of last year. The roller which delivers the ore to the battery is placed at the mouth of the chute leading from the hopper, to which it acts as a gate. When the roller is at rest the ore remains in the chute, but on its slightest forward movement a portion of the ore is forced into the battery. The chute is constructed to deliver the ore on top of the rollers in a manner analagous to the way water is applied to an overshot water wheel, and if the flow of ore were constant the rollers would be rotated by it as the water wheel is driven by water. Owing to the slight movement of the roller required to deliver the ore, a very small amount of power is required, not detracting from the efficiency of the stamps that operate it. The delivery is readily regulated. The feeders will feed the ore to any desired number of stamps according to the length of the rollers.

Blasting in Mines - No. 10.

Removing the Dislodged Rock.

As the removal of the rock brought down by the blast consumes a large proportion of the time saved by machine boring, it becomes necessary to provide means for reducing this loss to a minimum. The most important of these means consists in a suitable provision for the rapid removal of the machine to a place of safety, and a conveniently designed and well-laid tramway upon which the rock may be quickly run out without confusion, and its consequent delay. The tubs should be of such dimensions as to be handled without great difficulty. The importance of this condition will be understood when the frequency of derailments is borne in mind. The shoveling up of the rubbish is greatly facilitated by laying iron plates in front of the face to be brought down previously to the firing of the blast. This expedient is generally adopted in important drivings. It has also been remarked that the dislodged rock can be more rapidly removed when it exists in small blocks. Thus there will be an advantage in placing the charges and in regulating their strength so as to completely break up the rock. Another matter of importance in the arrangements for the rapid removal of the rock brought down by the blast is the proportioning of the number of hands employed to the requirements of the case. This number will increase with the size of the blocks to be lifted, the distance to be run over, and the want of suitability in the *material* employed.

Division of Labor.

A proper division of labor is greatly conducive to rapid and economical progress. Andre, in his treatise on "Coal Mining," from which we take these facts, says that the operations may be divided into three series, namely, boring the shot-holes, charging and firing, and removing the rock dislodged. Each of these series of operations may be performed by different sets of men, and in several instances this division of labor has been adopted. But it does not appear that such a division leads to the most satisfactory results. The work of boring occupies a much longer time than either of the other two series of operations, and hence the distribution of the time is unequal. It has been found that, generally, where all the arrangements have been well considered, the labor of charging the shot-holes, firing the blast, and removing the rock brought down can be performed in about the same time as that of boring. Thus it would seem to be more conducive to economy of time to divide the men employed into only two sets: one set to bore the holes, the other to perform all the subsequent operations. This division has been adopted in numerous instances with favorable results. Sometimes the whole of the operations have been performed by the same set; but such an arrangement is not to be recommended. The labor of driving the machines is of too distinct and skilled a character to be confounded with that of blasting the rock and removing the debris without a strong reason for such a proceeding, which does not appear to exist. Besides reserving a set of men specially for this portion of the work, it is desirable to keep the same men to the same machine; for in such a case each man gets accustomed to the peculiarities of the machine entrusted to him, and besides conceives a kind of affection for it that leads to careful handling and watchful attention. In addition to the men required for the operations referred to above, smiths will be needed to resharpen the bits and to repair the machines. The amount of this labor will obviously depend upon the number of machines employed, and the hardness of the rock to be passed through.

California Kaolin Deposits.

The recent discovery of an immense deposit of kaolin (the finest china clay—used principally in the manufacture of porcelain, and proceeding from the decomposition of mineral feldspar) in the vicinity of Rush creek, two miles west of this city, appears now to have been a more important development than was at first imagined by the most enthusiastic of the locators. Numerous authorities at San Francisco and the East have been consulted as to the quality of the material, and the returns so far received all go to indicate that it is of a high grade and fully adapted to the uses required of it. A fear had prevailed here that the deposit would prove useless without the discovery of an accompanying bed of fire-clay, from which to make the seggars or cylindrical cases in which the ware is baked, but this, upon investigation, proves to have been a mistake, as the kaolin itself can be and often is used for that purpose. Undecomposed feldspar, also used largely in connection with kaolin in the making of ware, abounds throughout this immediate locality in large quantities; fuel is abundant, and in fact all the conditions look favorable for an early establishment of large potteries in this township, especially as men experienced in the business and with plenty of capital announce their readiness to embark in the enterprise as soon as they become thoroughly satisfied about the extent and quality of the clay. With such an industry started successfully, steady employment would be given to many people at fair wages, and the help of boys and girls would be in constant demand, as is always the case where potteries exist.

The Nevada City Company, whose location embraces 160 acres, have been at work a week and have from 20 to 30 acres of the bed uncovered. This task is made easy from the fact that in early days the placer miners washed over the surface of that whole section in their search for gold, which search was richly rewarded, by the way,—and only a comparatively thin layer of gravel and bowlders was left behind. The company have sunk down to a depth of about ten feet in several places, and find steady improvement in point of purity as they descend. They believe the deposit to be very deep, and propose to thoroughly prospect it at once by means of shafts, etc.

The Nevada County Company, owning the adjoining claim, also have 160 acres, and equally as good prospects. They will shortly have their ground thoroughly explored.

Capt. Moore, Superintendent of the Nevada City Company, and formerly a worker in English potteries, says he can readily extract and clarify twenty tons a day. In 1865 he secured a patent on a machine that greatly facilitates the purifying process.—*Nevada Transcript.*

IT is expected that next year will see a very large immigration into California, and that, too, of the very best class of people. It is reported that a very lively interest in this State has been excited in the Western and Northwestern States, and that men of means and prominence have begun to look to California as a home.

THE day car of the Southern Pacific Railroad passed through Fresno on Thurday with about $700,000 on board, which will be paid out between that place and New Orleans.

ALL iron preparations blacken the teeth, constipate the bowels, and give headache, with one exception, that is Brown's Iron Bitters.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

M. P. OWEN—Santa Cruz county.
J. W. A. WRIGHT—Merced and Tulare counties.
JARED C. HOAG—California.
B. W. CROWELL—Colorado, Utah and Montana.
M. H. JOSEPH—Eureka, Nev.
I. M. LEIBY—San Bernardino and San Diego counties.
J. J. BARTELL—Santa Clara county.
H. W. FOLSOM—Los Angeles county.
C. E. CURTIS—Kern and Inyo counties.
A. S. DENNIS—San Mateo county.
GEO. FRANCOEUR—Shasta county.
J. W. BOYER—Contra Costa county.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING SEPTEMBER 25, 1883.

285,541.—AGRICULTURAL BOILER—S. N. Mford, Portland, Or.

285,462.—REVERBERATORY FURNACE—J. H. Canavan, Globe, A. T.

285,463.—PLOW—Jas. Clausen, San Luis Obispo, Cal.

285,495.—LUBRICATOR—M. L. Conway, S. F.

285,710.—FIRE ESCAPE—F. C. Eal, Jefferson City, M. T.

285,481.—MOLD BOARD FOR SIDE HILL PLOWS—Paul Gregory, Davenport's Landing, Cal.

285,187.—APPARATUS FOR REMOVING SAND BARS—J. H. Huller, Jacksonville, Or.

285,753.—NASAL INHALER AND INVIGORATOR—Jas. Keck, Portland, Or.

285,755.—SAMPLE EXHIBITOR FOR WALL PAPERS—Jas. F. Kidd, Stockton, Cal.

285,757.—SLATE PENCIL SHARPENER—W. P. Kirkland, S. F.

285,422.—THRASHING AND CLOVER HULLING MACHINE—A. W. Lockhart, Sacramento, Cal.

285,495.—CHECK BOX—David Lubin, Sacramento, Cal.

285,499.—STATION INDICATOR—Thos. Melrose, S. F.

285,508.—AMALGAMATING ORES AND SAND CONTAINING GOLD—A. B. Paul, S. F.

285,514.—CABLE RAILWAY—Henry Root, S. F.

285,520.—APPARATUS FOR EXTINGUISHING FIRES ON VESSELS—A. F. Spawn, Oakland, Cal.

285,702.—SANDBOARD FOR RAILWAY—T. W. Stapleton, Portland, Or.

285,530.—COMBINED CANE AND FAN—Wm. Verbeck, S. F.

285,720.—HEADER—Jos. H. Winn, S. F.

285,601.—LEVEL SQUARE—M. Farley, Portland, Or.

10,606.—TRADE MARK—J. R. Williams, Stockton, Cal.

3,547.—LABEL—M. A. Scott, Livermore, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

MOLD BOARD FOR SIDE-HILL PLOWS.—Paul Gregory, Davenport's Landing, Santa Cruz county. No. 285,481. Dated September 25, 1883. The mold boards of plows designed for level land have long since been found unsuitable for side-hill work, and a straight mold board which was tried was found undesirable because of its rear end, which was left straight, cutting the sod already thrown out. To remedy this a convex mold board was adopted with a slightly curved or rounded rear edge, under the impression, which still prevails, that it would not only pass over the thrown-out sod without cutting it, but would throw the sod out of the furrow to the best advantage. Side-hill plows now used have this convex mold board, though lately there appears a tendency to return to the straight mold board with a rounded rear end, as being better. Mr. Gregory finds objections to both forms. The object of his invention is to provide a mold board for this class of plows which shall turn the earth out of the furrow to one side, to the best advantage both as regards the completion of the throw and the progress of the plow, with the least hindrances. To this end his invention consists in a mold board having a laterally concave face, its rear edges being rounded (or convex) to a point to avoid cutting the sod.

CHECK BOX.—David Lubin, assignor of one-half to Harris Weinstock, both of Sacramento. No. 285,495. Dated Sept. 25, 1883. This apparatus is specially designed for the use of cashiers in stores where the salesmen use slips or checks upon which are written the amount of each sale as made, and which are transmitted to the cashier; or it may be used for tallying grain or other articles belonging to different owners which may be shipped all together, or for other similar purposes, as in brokers' accounts, and for voting or election purposes, etc., the results being only accessible to the proprietor, confidential clerk, or those whose duty it is to examine, and who have the key.

HEADER.—James H. Winn, Benicia, Solano county, assignor to Baker & Hamilton, S. F. No. 285,720. Dated Sept. 25, 1883. The invention consists in the peculiar arrangement of a compensating spring, executive pulley, and beam. In lowering the front the tendency of the header to go down is resisted by the spring, and the stronger the tendency the greater the resisting power of the spring. The beam is made in two pieces, and is strong, light, and will not warp. The details of construction of this machine are the main improvements.

PLOW.—James Clansen, San Luis Obispo. No. 285,463. Dated Sept. 25, 1883. The invention is especially applicable to plows which are designed to be used in heavy or sticky soil, to enable them to scour or clean themselves. It consists of a high-arched beam having a vertically and horizontally adjustable clevis, and a mold board formed of independent strips diverging upward and backward from the share, so as to leave openings between them. Each strip is braced so as to stiffen it, and the land side is also made very narrow.

APPARATUS FOR REMOVING SAND-BARS.—John H. Huller, Jacksonville, Jackson Co., Oregon. No. 285,487. Dated, Sept. 25, 1883. This invention relates to certain improvements in apparatus for removing sand-bars or similar deposits at the mouths of rivers or harbors, and it consists of a receiver or chamber, of sufficient diameter to rest upon the bottom, provided with jet nozzles through which water is forcibly ejected against the bottom, so as to wear it away. The receiver is connected with the vessel or boat carrying the pumps and machinery by a flexible tube, through which the water passes from the pumps, and the tube is provided with bands surrounding it at intervals. These bands have eyes at each side through which wire ropes or chains pass from the boat to the receiver, and hold them together without strain on the tube.

LUBRICATOR.—Michael L. Conway, S. F. No. 285,465. Dated Sept. 25, 1883. This lubricator consists of a novel combination and arrangement of parts by which different parts of a machine may be lubricated from a single oil vessel. The object is to provide a simple, effective and steadily operating lubricator for steam engines.

COMBINED CANE AND FAN.—Wm. Vorbeck, S. F. No. 285,530. Dated Sept. 25, 1883. This is a fan combined with a cane or parasol-handle, so that the fan can be drawn out for use at any time, and when not in use lies concealed.

News in Brief.

THE rains have stopped the mountain fires.

TWENTY-TWO Omaha Indians have been taken to the Exposition at Paris.

BUSINESS at Canton is entirely suspended, owing to the unsettled condition of affairs.

THE first-class passenger rate from Kansas City or Omaha to San Francisco has been reduced to $95.

STOCKTON licenses liquor dealers at $15 per quarter, and has fixed the county and state tax at one per cent.

SEVERAL hundred cords of wood have been seized at Clinton, Mono county, by United States timber agents.

THE United States sloop-of-war *Yantic*, from St. John's, N. F., arrived in New York Saturday, bringing the survivors of the *Proteus*. All were well.

THE Omaha Board of Education has decided to try the experiment of the kindergarten system in some of the lower grades of the Omaha public schools.

THE steamer *Newbern*, from Mexico, is quarantined in San Francisco bay with five cases of yellow fever aboard. All but one of the patients are convalescent.

A TRUE iron medicine, beneficial to the young as well as the old, who suffer from dyspepsia, etc., is Brown's Iron Bitters.

INFORMATION WANTED.—Information is wanted of Wm. Erskine, who has been living near Hailey, Alturas county, Idaho Territory, for two years past. His wife has not heard from him since last Spring. He was President of the Miners' Union of Silver City, Idaho, five or six years ago. Any news of him would be thankfully received by Mrs. Hannah Erskine, of Nevada City, Cal., or R. H. McDonald, Los Angeles, Cal.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

NOTICE TO CREDITORS.

ESTATE OF ROSEMOND GREENWOOD deceased.—Notice is hereby given by the undersigned, executor and executrix of the last will and testament of Rosemond Greenwood, deceased, to the creditors of, and all persons having claims against the said deceased, to exhibit them with the necessary vouchers, within four (4) months after the first publication of this notice, to the said executor and executrix, at the office of E. W. Blancy, Esq., attorney-at-law, No. 526 Montgomery Street, the same being the place for the transaction of the business of said estate, in the City and County of San Francisco.

Dated at San Francisco, the 2d day of October, 1883.

GEORGE SPAULDING,
MARY WILLIAMS,
Executor and Executrix of the last Will and Testament of ROSEMOND GREENWOOD, deceased.

Cheap Ore Pulverizer.

There is for sale in this city, by I. A. Heald, American Machine and Model Works, 111 and 113 First St., a Rutherford Pulverizer, an improved revolving barrel crusher, which was only used a few times and is as good as new. It will be sold very much below cost, and parties who are in need of such an appliance for a small mill will do well to make inquiries concerning it. It is suitable for a pulverizing mill for powder or other substances. Reference as to above can be had upon applying to Heald's office.

FINE WOOD PHOTO-ENGRAVING
SEND COPY FOR ESTIMATE. IT WILL PAY YOU
CROSSCUP & WEST.
702 CHESTNUT ST. PHILA. PA.

PLAIN TRUTHS

The blood is the foundation of life, it circulates through every part of the body, and unless it is pure and rich, good health is impossible. If disease has entered the system the *only* sure and quick way to drive it out is to purify and enrich the blood.

These simple facts are well known, and the highest medical authorities agree that *nothing* but iron will restore the blood to its natural condition; and also that all the iron preparations hitherto made blacken the teeth, cause headache, and are otherwise injurious.

BROWN'S IRON BITTERS will thoroughly and quickly assimilate with the blood, purifying and strengthening it, and thus drive disease from any part of the system, and it will *not* blacken the teeth, cause headache or constipation, and is positively *not* injurious.

Saved his Child.

17 N. Eutaw St., Baltimore, Md.
Feb. 12, 1880.

Gents:—Upon the recommendation of a friend I tried BROWN'S IRON BITTERS as a tonic and restorative for my daughter, whom I was thoroughly convinced was wasting away with Consumption. Having lost three daughters by the terrible disease, under the care of eminent physicians, I was loth to believe that anything could arrest the progress of the disease, but, to my great surprise, before my daughter had taken one bottle of BROWN'S IRON BITTERS, she began to mend and now is quite restored to former health. A fifth daughter began to show signs of Consumption, and when the physician was consulted he quickly said "Tonics were required;" and when informed that the elder sister was taking BROWN'S IRON BITTERS, responded "that is a good tonic, take it."

ADORAM PHELPS.

BROWN'S IRON BITTERS effectually cures Dyspepsia, Indigestion and Weakness, and renders the greatest relief and benefit to persons suffering from such wasting diseases as Consumption, Kidney Complaints, etc.

Dewey & Co.'s Scientific Press Patent Agency.



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ASSESSMENT NOTICE.

Seaton Gold Mining Company.—Location of principal place of business, San Francisco, California. location of works, Dry town, Amador county, Cal.

NOTICE is hereby given that at a meeting of the Board of Directors, held on the 27th day of September, 1883, an assessment (No. 1) of ten cents (10c.) per share was levied upon the capital stock of this corporation, payable immediately in United States gold coin, to the Secretary at the office of the Company, Room 6, No. 528 California Street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 1st day of November, 1883, will be delinquent, and advertised for sale, at public auction, and unless payment is made before, will be sold on Monday, the 19th day of November, 1883, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

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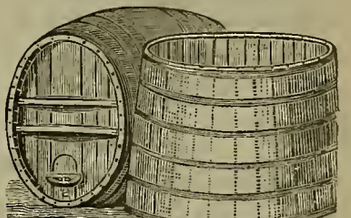
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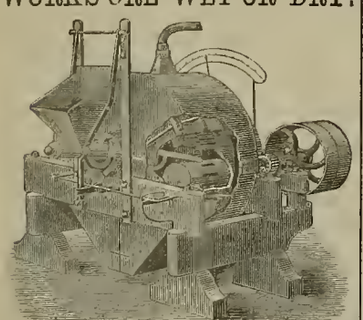
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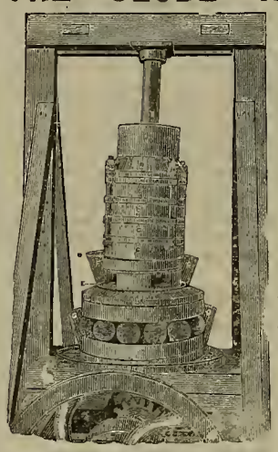
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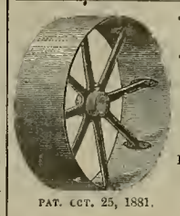
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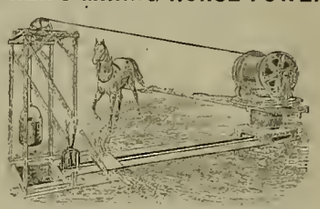
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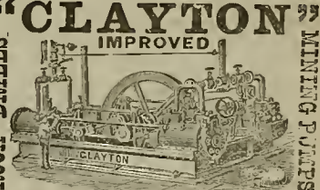
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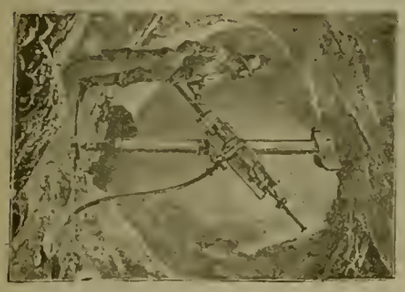
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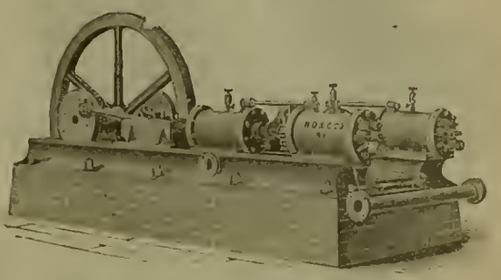
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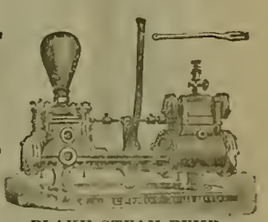


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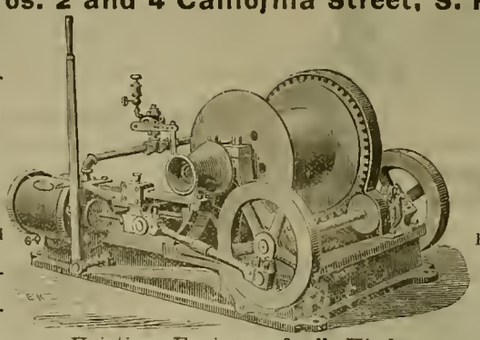


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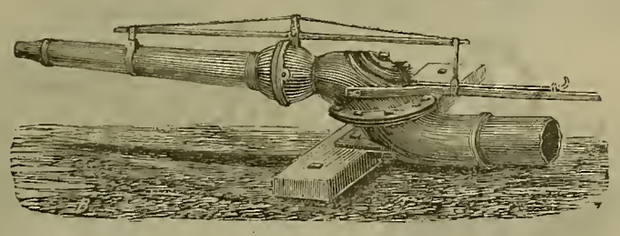
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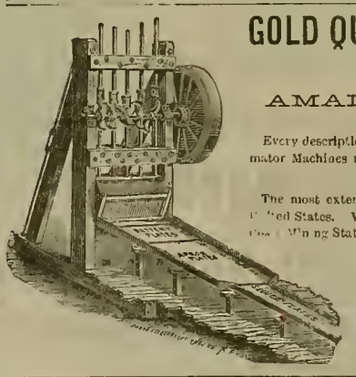
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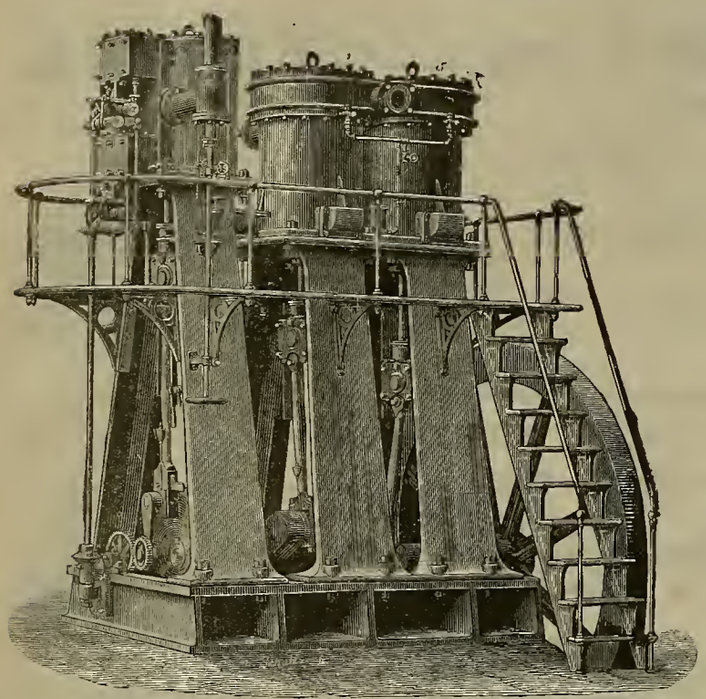
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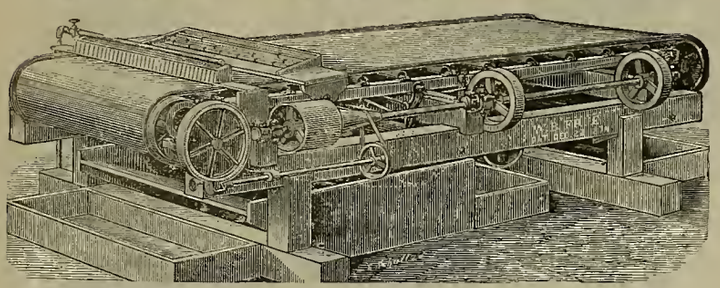
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That legal advice has been given that *all shaking motion* applied to an *endless traveling* belt used for concentration of ores is an infringement on patents held and owned by the Frue Vanning Machine Company.

That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.

That the patent laws make *users* of infringements responsible as well as makers, and the public is therefore warned that there is considerable risk in purchasing any end-shake machine until our various patents have been decided.

That if there are those who for any reason prefer an end-shake machine, we can manufacture and sell to such machine of that description, as efficient as the Triumph, and at a lower price, and no liability for infringement will then be incurred by the purchaser.

That we shall protect ourselves against any one making, selling or using any machine infringing any of our patents. Patented July 9, 1867; May 4, 1869; Dec 22, 1874; Sept. 2, 1879; April 27, 1880. Patents applied for.

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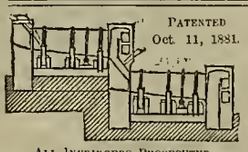
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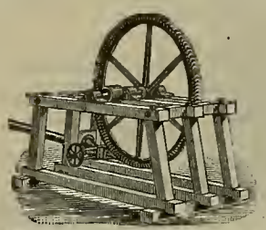
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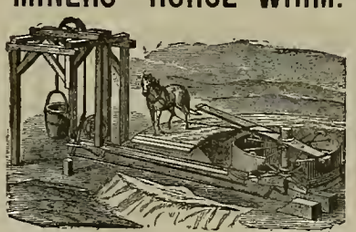
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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, OCTOBER 13, 1883.

VOLUME XLVII Number 15.

A New Virgularian Zoophyte.

Recent pages of the proceedings of the United States National Museum contain a description of a new compound polyp, belonging to the group known to science as *Virgularia* (from virgula, a little rod), which consists of a central slender stalk, or axis, which looks, when free from the exterior or investing mass of polyps, very much like a peeled willow switch, or wand. This, when the animal is alive, is covered with a semi-translucent, fleshy or jelly-like substance, rather firmer than ordinary jelly, and usually of a pinkish color. Upon examination it will be seen that this fleshy substance, or sarcode, as it is called, is a perfectly organized animal form, compounded of many small forms, each resembling a sea-anemone, the edge of the mouth or oval opening in each being fringed with eight delicate feelers or tentacula; and these tiny living sea-flowers are in different species arranged along the length of the rod, sometimes in rows crosswise like so many letter v's, (∧∧∧∧∧) and again one over another, not in cross rows, but singly, like this (≺≺≺≺), up and down the stalk; and again wound somewhat spirally around the central rod or axis; sometimes, also, in double and treble rows lengthwise of the rod, which looks like a long, slender stem with living flowers on each side.

In the great virgularian described about ten years ago by Dr. R. E. C. Stearns * the stock is sometimes eight feet long, and its surface often exhibits as many as 250 V-shaped rows of polyps, aggregating over 5,000 in the entire colony or animal. Each one of these tiny animal flowers is fixed and stationary in its place in the row or on the stalk, and forms a part of this wonderful compound animal, which, as a whole, has duets and circulatory arrangements running throughout its entire length, and probably connecting with each one of the five thousand; and the food secured by either one of the numerous small polyps helps to nourish the whole mass. The stalk or axis, which as before remarked looks like a slender peeled willow switch, tapers at each end, and is the only hard portion, and when dry is somewhat like bone in texture. The form referred to as a new species is found in Japanese waters, and is sometimes three feet long, with a row of polyps arranged in a single series, one above another along one edge of the rod, which is obtusely quadrangular in cross-section. Its most striking peculiarity, as particularly pointed out by Dr. Stearns, who is also the describer of this, is that the lower end of the stalk or axis, instead of being simply tapering, has a fork-shaped root of several irregular prongs, showing that it is sedentary in its habits and permanently fixed or attached to the rocks at the bottom of the sea, and not able to move about at times as can the other species, which, when not floating, have the lower or basal end in the mud or sand of the sea-bed, and stand in an upright position like rushes, which has caused them to be sometimes known as sea-rushes.

This new form with the root-shaped base is particularly interesting, as it connects the sea-rushes or virgularians with the *Gorgonia* or sea-fans.

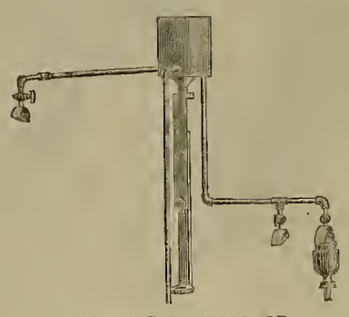
The President has accepted two sections of the Northern Pacific—one of 50 miles in Montana, and the other of 36 on the Columbia River to Portland, Oregon.

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* Haliptera Blakei.

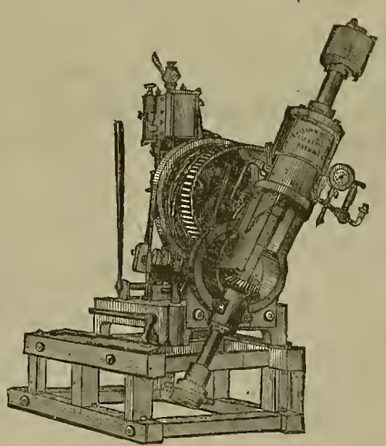
An Improved Lubricator.

On the main engine at the Mechanics' Institute Fair is a peculiar lubricator, recently patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, by Michael Conway of this city. An engraving of this new device is shown on this page. A large oil-reservoir, of any suitable pattern, is mounted on a standard and filled with oil. Tubes or small pipes connected with this extend to points where a supply of lubricant is needed. Upon the ends of these pipes or tubes are secured small arms, between and to the ends of which is received a strip of lampwick, with sides turned up to form a sort of trough to receive the dripping oil.



CONWAY'S LUBRICATOR.

The end of each of the small distributing pipes is open, or rather has a cock to regulate the flow of oil from it. As the oil drops from the ends of these pipes it falls on to the strips of lampwick, which thus become saturated with the oil. As this lubricator is intended mainly to supply oil at such points of an engine as the eccentrics, wrist-pins and main journals, at each of these points is screwed, in the usual manner, the cup for oiling the journal. This cup is provided with a diametrical blade or scraper of thin metal, the upper edge of which projects slightly above the rim of the cup, while its lower portion extends down within the cup some distance. This cup, with its scraper, is a brass casting, all in one piece.



A NEW PROSPECTING MACHINE.

In the revolution of the machinery the brass oil-cup comes in such close proximity to the saturated fabric that its scraper passes along the under surface of the oil-saturated lampwick, and scrapes the surplus oil from it, which then passes down the scraper into and through the cup to the journal.

The strip of lampwick may be renewed when required, its small cost and the facility of adjusting a fresh strip rendering the operation practicable. The supply of oil is certain and regular. The supply of oil to the cups may be very nicely regulated by means of the cocks at the ends of the pipes or tubes.

It is intended that the different parts of the engine may be lubricated from a single oil vessel, oil tubes with wicks being provided to extend to the different bearings needing lubrication.

Messrs. John Broderick and John A. Hamilton, both of this city, are interested in this invention with Mr. Conway. The Fulton foundry (Hinckley, Spiers & Hayes), 220 Fremont street, manufactures these lubricators.

International Electrical Exhibition.

It is announced that an exhibition of electrical appliances, is to be held in Philadelphia, commencing Tuesday, Sept. 2d, 1884, under the auspices of the Franklin Institute. From the eminent reputation of this institution, coupled with the fact that the projected exhibition will be the first in America exclusively devoted to this important and progressing branch of science, the above announcement has attracted unusual interest throughout the United States, and the exhibition will undoubtedly afford an admirable opportunity of witnessing a representative display of American discovery and invention in electricity. To increase its scientific and industrial importance, as well as to add to its attractiveness, it was determined shortly after its inception to give it an international character. The importance of the project having been properly represented to Congress, an act was passed which, having received the signature of the President, is now the law. This official recognition provides for the admission into the United States, duty free, of all articles for exhibition only.

The subject of electricity and its application is now attracting unusual attention, and the exhibition, side by side, of the best achievements of both America and Europe, can not fail to be in the highest degree instructive. The Franklin Institute will endeavor to secure a large representation of the progress of foreign countries, and the most liberal provisions will be made to place European and American exhibitions on a fair and equal footing.

The electrical exhibitions held in Europe of late, have attracted great attention. The progress in this branch has been so marked within the past few years, that a very large number of new appliances have been invented and perfected. Our own country has many workers in electrical science, and we ought to make an exhibit which will compare favorably with the efforts of older countries. This exhibition is sure to be an interesting one, the results of which will be of benefit to the public.

The National Association of Window Glass Workers at Pittsburg, now engaged in a strike against a reduction, have formed a combination with $1,000,000 capital, for the purpose of entering into manufactures in opposition to their late employers.

A New Prospecting Machine.

The Sullivan prospecting machine is illustrated by an engraving on this page. It is a diamond core drill, simple in construction, and of great strength and lightness. There is a single hydraulic cylinder with the drill rod carried up through the piston rod instead of the two cylinders with drill rod outside. By this improved hydraulic feed the speed of the feed is governed by the resistance met with; while the diamond head and the lengths of tubing are not liable to be torn to pieces by the sudden intervening of hard substances. The pressure is indicated by a gauge.

The machine is set on a low spring frame with a geared track, so that when the drill rods with the core are to be raised the machine is run back out of the way by a simple device, and the rod is attached to the hoisting rope and steam windlass. These are driven by the same engine which at other times revolves the drill. The pipe is lowered by the help of the same windlass, an ingenious safety-jack preventing the loss of pipe in case of any breaking of the wire rope or attachment, and the drilling machine is then brought back into exactly the former position.

With each machine are provided drill rods for drilling 200 feet of hole with, proper connections; a core barrel to receive and preserve the cores as cut; two core lifters of an improved pattern; a diamond drill head, set with castings of best quality; an improved safety jack and lifting jack, and the necessary tools and equipment. The Berry & Place Machine Company in this city are agents for this machine for the Pacific Coast.

Early History of the Comstock—No. 5.

Since my return from Arizona my attention has been called to a letter in the PRESS over the signature of Robt. G. Lowery, of Virginia City, Nevada. Mr. Lowery says I took over the first ore from the Comstock, and gave the same to Mr. Theal, of Marysville, for assay, and that this was the first. This is a mistake. My first trip to the Comstock was about the 1st of July, 1859. B. H. Harrison had already taken (in June, 1859) some ore to Grass Valley for assay. About the 9th or 10th of July, 1859, I sent to Marysville by John C. Fall for Mr. Theal to assay some ore. Mr. Lowery's letter as to particulars is correct enough excepting as to dates.

E. P. MCCURDY.

San Francisco, October, 1883.

DOUBLE EDITION.—The next number of the MINING AND SCIENTIFIC PRESS will be a double one, and will contain a very complete description of the latest built of our local cable roads. It will be fully illustrated. The number will be one suitable for sending away to people elsewhere, who are curious as to the mode of operation of cable railroads.

THE SALMON WELLS.—We recently made mention of the gas well on the ranch of Cutler Salmon, near Stockton. The gas has continued to flow, and Mr. Salmon has piped it all through his house, and is using it for illuminating and heating purposes. He believes his water wells have peculiar curing properties, especially for kidney troubles, and proposes to build a bath-house, sanitarium, and otherwise improve the property as a health resort.

THE Bank Presidents of Boston have adopted a resolution that the speedy enactment by Congress of a national bankrupt law, equitable in its provisions for debtor and creditor in all sections of the country, is indispensably necessary.

On the Structure and Genesis of the Bassick Ore Deposit.

[Read before the California Academy of Sciences May 7th, 1883.]

The Bassick mine is situated in Central Colorado, about 125 miles south of Denver, on the western slope of the Wet Mountain Range, at an elevation of about 9,000 feet. It was discovered in 1877, and to-day is capitalized at $10,000,000 and its workings have attained a depth of over 1,000 feet. The first ten tons of ore taken out just below the surface returned $12,000. Unsystematic and intermittent working of the mine for two years yielded $500,000 net, leaving $2,000,000 in actual sight within 242 feet of the surface. The amount of bullion produced to date is unknown, as the utmost secrecy appears to be affected by the present owners; but it is safe to assume that it runs high into the millions.

It is, however, in the peculiar mode of occurrence of the ore body, that the main interest lies. The unusual features of the ore mass attracted the attention of the discoverer, and have puzzled and mislead the acutest observers who have thus far studied the deposit in place. My attention was first attracted to the locality in June, 1879, by Mr. J. B. Farish, at that time in charge of the Siver Cliff mine, six miles from the Bassick. A very intelligible description of the principal feature of the deposit, accompanied by illustrative specimens, selected according to my own instructions, was received. Based upon Mr. Farish's description and a careful examination of the specimens, a theory which explained the formation of the deposit to my own satisfaction was formulated and communicated by letter, Sept. 16, 1879, to Mr. Farish. It was pronounced by the gentleman in charge of the mine as the only acceptable explanation that had been brought forward.

Simultaneously Prof. J. S. Newberry, of the Columbia School of Mines, New York, delivered a lecture on the Bassick mine before the New York Bullion Club, in which, after characterizing the deposit as the most remarkable he had ever seen, he propounded a theory of its formation quite different from my own.

In the New York *Daily Graphic* of August 28, 1879 (a copy of which came to hand six months later), appeared an excellent history and description of the mine, apparently from the pen of George W. Rafter, a professional engineer of Rochester, New York, as editorial correspondent. The theory proposed by this gentleman comes nearest to my own explanation. He makes no mention, however, of a feature regarded by all as the most puzzling fact to be explained, viz., the occurrence of charcoal, at various depths, in the ore-body. An accurate cross section sketch appeared in the extra mining number of the New York *Daily Graphic* for October, 1879.

The most complete and systematic description of the ore-deposit yet made is presented by L. R. Grabill, in a paper read at the Colorado meeting of the American Institute of Mining Engineers, for August, 1882. But, while the description is excellent, the explanation of the phenomena is still very much at fault.

The latest statement concerning the ore-deposit is contained in the editorial correspondence of the San Francisco MINING AND SCIENTIFIC PRESS (Letter No. 8, from the Denver Exposition), published October 7, 1882. It may be considered as representing the current opinions of those most familiar with the deposit in its immediate neighborhood. They are still, I believe, wide from the truth.

I have thus indicated the articles that have already appeared on the subject, containing the views which I shall criticise. Before proceeding with this, however, I wish to present, as concisely as possible, a description—first, of the general topographical and geological features of the immediate neighborhood; second, of the detailed structure of the ore-deposit itself.

Fig. 1 represents the general geological features of the region adjacent to Rosita, taken from Hayden's Colorado Atlas of the United States Geological Survey of the Territory. The stars represent the cretaceous formations of the great western plain; the horizontal shading, the metamorphic granite; the dotted shading, the silurian sandstone of the Sangre di Cristo range; the crossed shading in the Sangre di Cristo represents eruptive granite; the crossed shading on the western slope of the Wet Mountains, the eruptive trachyte; the unshaded portions, quarternary. The position of the Bassick mine is indicated by the white star in the eruptive trachyte.

Fig. 2 represents a cross-section through the same region, along the line *a b*. The eruptive trachyte is represented by the vertical shading to the west of the summit of the Wet Mountains.

The Colorado Front Range (here locally known as the Wet Mountains), on the western slope of which the Bassick mine is located, forms in Colorado the easternmost range of the great system of North American Cordilleras. The tertiary and mesozoic formations of the great western plains sweep gradually up to the very base of the range, with an elevation of 6,000 feet, the latter rising some 1,500 feet on the eastern flank. The main body of the range consists of archaian granite, the highest peaks of which attain an elevation of over 11,000 feet. Wet Mountain valley, drained by Grape creek, into the Arkansas, separates the Front Range from the long, narrow, sharply defined range to the west known as the Sangre di Cristo, 13,000 feet high, consisting of a central axis of eruptive granite, with carbouiferous sandstone on the east and west flanks.

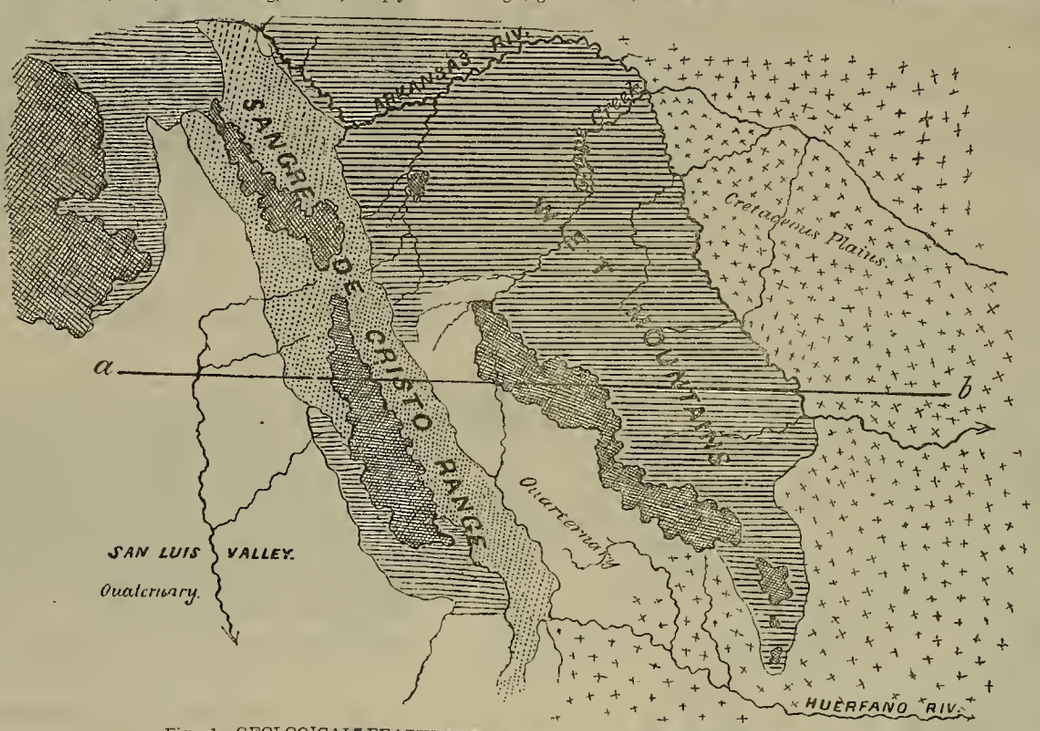


Fig. 1.—GEOLOGICAL FEATURES OF REGION ADJACENT TO BASSICK MINE.

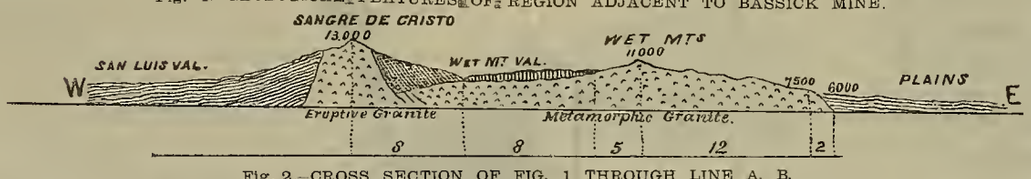


Fig. 2.—CROSS SECTION OF FIG. 1 THROUGH LINE A. B.

To the west of this range lies the great San Luis valley, covered with lake drift. The distance from the eastern base of the Wet Mountains to the summit of the Sangre di Cristo is about 35 miles. Within this region, the principal tertiary eruptives occur on the west slope of the Wet Mountains, extending down into the valley. Here a mass of trachyte, 35 miles long, 4 miles greatest width, and about 1,000 feet thick, rests immediately upon the granite. It is just within the eastern limit of this trachyte, at an elevation of about 9,000 feet, and about 5 miles west of the highest summits of the Wet Mountain range, that the Bassick mine is located. A vertical cross-section through *a b* will make the relation of these rocks clearer.

The Bassick Mine.

NOTE.—In the following description of the Bassick ore deposit I have followed mainly Grabill: "On the peculiar features of the Bassick mine," Trans. of the Amer. Inst. of Mining Engs., Aug., 1882:

Coming now to the immediate vicinity of the Bassick mine, we find it located within the limits of the trachyte on the western flank of the Wet mountains, about half a mile from the contact with the granite formation. The ore body crops out on the summit of a small elevation known as Bassick Hill, which terminates a short spur running out to the southward from Mount Tyndall.

[Fig. 3 represents in plan the relation of Bassick Hill to Mount Tyndall, kindly sent to the writer by Mr. J. B. Farish. The dotted line connecting the summit of Mount Tyndall with the Bassick shaft indicates the course of the connecting ridge. Fig. 4 represents a cross section through A B of Fig. 3, taken from the mining number of the New York *Graphic* for October, 1879, the accuracy of which is vouched for by Mr. Farish.]

The hill is about 200 feet high, and from 700 to 1,200 feet across the base. This whole hill consists of an apparent "conglomerate," *i. e.*, of more or less rounded fragments varying in texture from porphyritic to quite compact; in color, from gray and pink to white; and in size, from the fraction of an inch to 'rarely' 20 feet; although most of the "bowlders" are not over 1 foot in diameter. At first glance, the bowlders appear to represent more than half a dozen different kinds of rocks, and, indeed, it would be difficult to convince an ordinary miner that such was not the case. A careful microscopic examination of those at my disposal has convinced me that all are primarily from at least three varieties of sanidine trachyte, a post tertiary igneous rock that has been poured forth in colossal masses within the limits of the Cordilleras. The causes of the variation in texture, color, and size, being intimately connected with the genesis of the deposit, I will explain subsequently. This bowlder appearance can also be traced for some distance up the ridge, connecting with Mt. Tyndall, where it gradually passes into solid, normal, igneous rock, identical in character with that of the bowlders, viz: sanidine trachyte. On the other side, to the south of Bassick Hill, the same gradual passage is observed, from the bowlder fountain to the solid, normal trachyte, also similar to that on the north. On the very summit of Bassick Hill, it was observed by the discoverer that each of these rounded bowlders was inclosed in a thin, uniform layer of ore. Subsequent developments have shown that a body of these ore-coated bowlders, varying from 60 feet to 100 feet in width, runs directly over the summit, and is traceable on the surface a distance of 400 feet. This ore body has been followed almost vertically downward over 1,000 feet, the entire mass consisting of bowlders with concentric coatings of ore.

The coatings vary, however, both in character and thickness across a horizontal section, and also in depth. In the center of the deposit and near the surface, the coat or shell usually consists of several concentric layers in immediate contact with one another, like the combs of an ore vein, but with the line of separation distinctly marked. The inner shell has a maximum thickness of about 3-16 inches and is a mixture of zinc blende, galena, and a double sulphide of lead and antimony, and carries about 60 oz. silver, 3 oz. gold.

The next coat or shell (not always present) is somewhat similar to the first, slightly thicker, but carries as high as 200 oz. silver, 100 oz. gold. The third consists mainly of coarsely crystalline zinc blende varying from ¼ inch to two inches in thickness, and carries the larger portion of precious metal in the mine, viz:

60.—120 oz. silver.
15.—50 oz. gold.

This is often the last coat, and when so, the angles of the sphalerite crystals project outward into the free space between the bowlders. A fourth coat, consisting mostly of chalcopyrite, is sometimes present, but exceedingly thin, carrying:

50.—100 oz. silver.
50.—100 oz. gold.

Rarely a thin sprinkling of pyrite crystals is found on top of the chalcopyrite, and may be looked upon as the fifth coat. The irregular space between the ore-coated bowlders is filled, partially or wholly, with powdery white kaolin; calamite and smithsonite are often met with in the upper portion of the deposit.

In passing from the center of the deposit outward, the coatings decrease in thickness: one or more disappear, until gradually, after becoming exceedingly thin, they disappear entirely, and this takes place *both ways* from the center *outward*.

From the center *downward*, the coats *increase* in thickness. At a depth of 150 feet below the summit of Bassick Hill one passes across a sharply defined water-line, above which all is oxydized, dry and "dusty;" below which the ore is bright, fresh, and very wet. Fahlore, the tellurides of gold and silver, with a quartz gangue, partially or completely fill the spaces between the ore-coated bowlders. The coatings become so thick as at times to *completely displace* the bowlder nucleus, and apparent bowlders of solid ore result.

A further feature, and one that has attracted more attention, perhaps, than any other, is the occurrence of fragments of charred wood—actual charcoal—in various parts of the deposit, from the surface to the deepest workings. It is sometimes silicified. It is far from plentiful, in fact, is of rare occurrence, but a piece is found now and then, sometimes imbedded completely in the ore, sometimes between the bowlders, sometimes imbedded in trachyte or bowlder nucleus.

It is the occurrence of this charred wood in the ore body (it is found equally, however, without the limits of the ore mass) that has most completely puzzled those who have examined and spoken, or written on the subject. The particular form which their theories have taken has been determined largely by the necessity for accounting for the presence of this charcoal.

Theoretical Considerations

I have presented very briefly the principal features of this famous ore deposit. I do not go more into detail because I do not intend to consider any of the minor questions involved, questions of the utmost importance in themselves, but which are equally involved in a detailed theory of the genesis of all ore deposits of metallic sulphides.

I shall attempt to sketch only the general features of a theory. This mine has been represented as something marvelous, as something entirely unique. Mr. Rafter says of it that "if it had been examined by the traditional gentleman who believed nothing he heard, and only half what he saw, he would from that moment have rejected even this slight credit of his senses. It is so different from everything else in the way of mines, so superior to all previous mining experiences that it is difficult to realize it after one has seen it, and impossible to describe after one has left it."

Mr. Grabill finds it replete with unsolvable problems. Now, I wish to show that the deposit is not unique, except, perhaps, in respect to the *scale* upon which the phenomena are presented; that we do not have to modify the currently received explanations of geological phenomena a hair's breadth in order to include within them all that we find on Bassick Hill. Each single feature presented here, apart from the others, has been observed elsewhere, and satisfactorily explained. Their occurrence together, and on so large a scale, constitutes the only novel feature, and even this might have been predicted.

I wish, then, simply to bring the Bassick mine into line with other fissure deposits, to show that the same general explanation accounts for all, and that local conditions entirely explain local differences.

First, a few words concerning the theories already proposed, and my objections to them.

Prof. Newberry's Theory.

Prof. Newberry's was first suggested; it is briefly this:

An open fissure was first formed, into which the drift material from the surrounding region, consisting of rounded, water-worn cobblestones

(CONTINUED ON PAGE 230.)

MECHANICAL PROGRESS.

Coke Driving out Anthracite.

During the present year coke has made startling inroads into the foundry of anthracite coal in the Eastern and Middle states, where formerly the best grades of Lehigh lump were used to melt the iron, in cupolas, for machinery and stove castings. Connellsville, Snow Shoe, and other cokes are so extensively used that not more than one-quarter or one-fifth of the quantity of anthracite used years ago is consumed. The low price of the coke and the comparatively stiff figures for the anthracite, have, of course, brought about this revolution. It is likely that the difference between the price of the two grades of fuel will not remain so great for any length of time, but the new rival is undoubtedly in many respects better suited for the purpose, and it will be difficult to dislodge it.

In regard to the use of petroleum, a contemporary says: Favorable reports of the latest efforts to smelt iron with crude petroleum we greatly fear have possibly exaggerated into a success what at bottom was an altogether unpromising failure. The attempt was made at iron works in South Boston with the Hayden generator, an elaborate and costly appliance, the invention of a naval engineer, which seems to be a sort of combination of the best features of every other like intended apparatus hitherto invented. This apparatus and experimentation with it have cost large sums of money.

Crude petroleum is to be used of the grossest sort, and even residium according to the friends of this invention, but we have seen it flatly asserted that in the course of the Boston experiments naptha has been worked in equal parts, at least with the crude patroleum employed, and that no attempt has been adventured to use the crude oil alone, while the requisite apparatus is altogether on too large a scale, and the accompaniments of the real furnace are so many and so expensive that the method should present overwhelming advantages in order to be adopted by any parties not interested in the success of the company owning the method.

Band Saw Blades.

A correspondent of the *American Journal of Railway Appliances*, who has been making some experiments in the strain of band saw blades, says:

"While I do not consider that they are exhaustive, I think they pretty nearly represent the average practice. Of course there is a wide difference in the ideas of operators about the necessary amount of tension on a blade, and my figures are based on my own judgment. The strain was weighed on an ordinary platform scale, by means of a lever and suitable fulcrums.

"For 3-16 inch blade, No. 21 gauge, running 3,500 to 4,000 feet per minute in ordinary sawing, the strain is 151 pounds. For ½ inch blade, No. 21 gauge, same conditions, 214 pounds. For one inch blade, No. 20 gauge, same conditions, 258 pounds. These figures are actual tension on the blade, the weight of the wheel and its bearing, and the friction on the ways first being deducted.

"On a heavier machine of my make for splitting or re-sawing, a 2½ inch blade, No. 20 gauge, running 5,500 feet per minute, cutting 19 inches wide, has usually from 1,100 to 1,300 pounds tension, including the weight of wheel and bearing and the friction on the ways."

In this connection it may be remarked that not every person can run a band log mill as they are now made. This is the principal reason that band-sawed lumber sells for more than circular-sawed. The man who successfully engineers a band saw mill is always capable of doing first-class work, and with the advantages his machine possesses over the circular mill for nice work, there is little wonder that his produce sells for more. There is likely to be a fond call for competent band saw millers within the next few years.

Asphalt Mortar.

THE *Centralblatt der Bauverwaltung* describes a patented composition made at a factory in Stargard, Pomerania, which has for some years past been used with perfect success on the Berlin-Stettin railway for wall-copings, water-tables and similar purposes requiring a water-proof coating. The material is composed of coal tar, to which are added clay, asphalt, rosin, litharge and sand. It is, in short, a kind of artificial asphalt, with the distinction that it is applied cold, like ordinary cement rendering. The tenacity of the material when properly laid, and its freedom from liability to damage by the weather, are proved by reference to an example in the coping of a retaining wall which has been exposed for four years to the drainage of a slope thirty-three feet high. This coping is still perfectly sound, and has not required any repair since it was laid down. Other works have proved equally satisfactory. In applying this mortar, as it is termed, the space to be covered is first thoroughly dried, and after being well cleaned is primed with hot roofing-varnish, the basis of which is also tar. The mortar is then laid on cold to a thickness of about ⅜ inch, with either wood or steel trowels, and is properly smoothed over. If the area covered is large, another coating of varnish is applied, and rough sand strewn over the whole. The water-proof surface thus made is perfectly impregnable to rain or frost, and practically indestructible. The cost of the material laid is estimated at not more than about ten cents per square foot, and it is stated that this price can be reduced by at least two cents for large quantities put down by experienced workmen.

CARE OF MACHINES.—If, says the *American Machinist*, manufacturers could get a saving clause inserted in a contract for machines that should make clear exactly the kind of treatment they would receive after they left their hands, it would sometimes be of more value to them than the price they received for them. That machinery is ruined by improper care, or for want of ordinary care, does not matter much to them; but the fact that their reputation is frequently unjustly injured by such causes is a matter of considerable importance. Whether machines are properly set, lubricated properly, or with the cheapest oil that can be bought; whether they are handled with reasonable care or knocked about any way; whether they are kept respectably clean, or run in an accumulation of grease and dirt; all these things, and a good many others that are supposed to make no difference to the builder after the sale is effected, really do often make a good deal of difference to him so far as future sales are concerned.

LENGTH OF BOILER TUBES.—Nine-tenths of the boilers which are now being put into the woolen and cotton mills of the United States are of the horizontal tubular type.

The usual length of the tubes in these boilers is 15 or 16 feet, and hence the heated gases travel 30 or 32 feet in their journey from the fire to the rear end of the boiler and back through the tubes to the entrance to the chimney. * * After the gases have traveled a distance of 32 feet they have generally become incapable of adding further to the heat of the steam, and hence it is almost a general law that boilers in which the gases travel more or less than 32 feet from the grate-bars to the chimney are uneconomical.

NOVEL NAVAL AND SIEGE GUNS.—The French government is experimenting near Lille upon some naval and siege guns of novel construction and enormous power. One of these, as described by a technical journal, is of steel, and nearly thirty feet long. The tube is strengthened with ten coils of plaited steel wire one millimeter (.039 inch) in diameter. The composition is such that the cannon, after a few discharges, becomes elongated by three millimeters. The weight of the gun is fifty tons; it projects a shell weighing 297½ pounds, capable of penetrating armor plates nearly six inches thick at a range of seven and a half miles, and its cost has been $116,160.

LOSS OF HEAT.—A source of considerable loss of heat in many American locomotives is the fragile condition of the ordinary run of ash-pans, that do not admit of being closed tightly by the damper doors. More loss of heat is caused by this than what is generally supposed. We observe that Rogers' Locomotive Works are putting boiler-sheet ash-pans on some of the locomotives they are turning out. We commend this plan to the attention of master mechanics.—*American Machinist.*

PAPER FROM SOAP-WEED.—Pueblo, Col., is soon to have a paper and textile mill, devised to utilize the soap-weed plant that grows so abundant in the southern part of the state. More than three years ago the editor of the Denver *Journal of Commerce* sent large quantities of this soap-weed to Hadley, Mass., to test its adaptation to paper purposes. This mill at Pueblo will be the result of that experimenting.

COMPLICATED MACHINES.—A writer in an Eastern journal says: "The tendency to complicate machines and make them universal, or machines of many kinds, is fast becoming extinct. It has been usually found to be a very much more costly way to produce work than with special machines made for one kind of work, or at least not many kinds of work, and then only when they were similar in their processes and manner of production and operation."

THE WEAKEST PLACE in a boiler will always be found along the line of some seam. This is due to the fact that the edges of the sheets are frequently hammered to close seams, and sometimes so carelessly that the skin of the iron is broken; and to the further fact that scale forms most readily along seams, for reasons which are obvious.

TRAP-DOORS IN CAR ROOFS.—A gentleman who was present at a most distressing railway accident where it was necessary to break open the roof in order to extricate some of the passengers—one car lying on its side on the ground, and another actually lying full length upon the first one—suggests that trap-doors be provided in the roofs hereafter.

SPIRAL SPRINGS.—It is strange, says the *Journal of R. W. Appliances*, that with all the march of modern improvements, in theory, practice, and the adoption of theory to practice, so little has been done, and so little is known, as in the matter of spiral springs.

SCIENTIFIC PROGRESS.

Man and Insects.

The only nerves (worth mentioning) in the human body, which are not under the control of the brain, are those of the heart and other internal organs; and over these parts, as everybody knows, we have not any voluntary power. But all our limbs and muscles are moved in accordance with impulses sent down from the brain, so that, for example, when I have made up my mind to send a telegram to a friend, my legs take me only to the telegraph office, my hand writes the proper message, and my tongue undertakes the necessary arrangements with the clerk. But in the insect's body there is no such regular subordination of all the parts composing the nervous system to a single central organ or head office. The largest knot of nerve matter, it is true, is generally to be found in the neighborhood of the sense organs, and it receives direct nerve bundles from the eyes, antennæ, mouth, and other chief adjacent parts; but the wings and legs are moved by separate knots of nerve cells connected by a sort of spinal cord with the head, but capable of acting quite independently on their own account.

Thus, if we cut off a wasp's head and stick it on a needle in front of some sugar and water, the mouth will greedily begin to eat the sweet syrup, apparently unconscious of the fact that it has lost its stomach, and that the food is quietly dropping out of the gullet at the other end as fast as it is swallowed. So, too, if we decapitate the queer Mediterranean insect, the praying mantis, the headless body will still stand catching flies with its outstretched arms, and fumbling about for its mouth when it has caught one, evidently much surprised to find that its head is unaccountably missing. In fact, whatever may be the case with man, the insect, at least, is really a conscious automaton. It sees or smells food, and it is at once impelled by its nervous constitution to eat it. It receives a sense impression from the bright hue of a flower, and it is irresistibly attracted towards it, as the moth is to the candle. It has no power of deliberation, no ability even to move its own limbs in unaccustomed manners. Its whole life is governed for it by its fixed nervous constitution, and by the stimulations it receives from outside. And so, though the world probably appears much the same to the beetle as to us, the nature of its life is different. It acts like a piece of clockwork mechanism, would up to perform a certain number of fixed movements, and incapable of ever going beyond the narrow circle for which it is designed.—*Grant Allen, in Knowledge.*

Reptiles in Disguise.

Everybody is fond of birds, but it is possible that some people might like them less if they believed them to be only reptiles in disguise. Now, Sir John Lubbock, addressing the British Association in 1881, said: "It seems to be generally admitted that birds have come down to us through the Dinosaurians (wonderlizards), and, as Huxley has shown, the profound break once supposed to exist between birds and reptiles has been bridged over by the discovery of reptilian birds and bird-like reptiles; so that, in fact, birds are modified reptiles." Popular likes and dislikes are no disproof of relationship. Birds with teeth and reptiles with feathers have been cited in evidence, although, indeed, they are very like "Cuckoo, cuckoo, welcome bird, seldom seen, but often heard" of. Birds and reptiles are alike reproduced from eggs; their blood corpuscles are equally oval, not round, as in mammal animals. Both, apparently, swallow their food without tasting it. Possibly the stomach may be, with them, the seat of taste, as it often is with us when we have taken physic or eaten stale fish, or too much sage and onion stuffing with duck. Both are musical. Serpents are fond of melody, though they cannot make it. Batrachians as well as bipeds have their grand united choral societies. American bullfrog concerts are celebrated as well as numerously attended. The song of thrushes and the wailing of nightingales may, therefore, be only developments of the green European tree-frog's resonant croak, effected, as with birds, by inflated expansions of the throat, very curious to witness. Froggy looks as proud as his predecessors in the fable, and one wonders that he does not, like him, burst. Feathers may be only a modification of scales. The so-called feathers of butterflies are really scales, whence their name Lepidoptera.—*London Society.*

Storm Sounds in Telephones.

A correspondent of *L'Ingenieur Conseil* occupied himself, during a violent thunder storm which occurred at Brussels some months ago, in listening to the storm sounds in a telephonic wire. It was furnished with a good lightning conductor, and, under such circumstances, he is convinced that the experiment was not attended with danger. During the height of the storm there was a continuous noise, which could only be compared to that of frying. From time to time it would grow louder; sometimes there would be a little popping sound, like a bubble bursting; sometimes the series of crackling noises which follow the fall of a drop of grease on a red-hot iron plate. This last noise came abruptly and loud with each flash of lightning, and seemed to precede it. The observer was satisfied that he could hear the sound before he could see the flash. The same noises were often produced when there was no accompanying flash, but then they were less loud. Their force seemed to have no connection with the peals of thunder. On the 600 lines of telephone wir which focus at Brussels not one apparatus was damaged by the storm, its effects being altogether expended upon the lightning conductors and storm-warning apparatus. This security may encourage other observers to follow the example of "E. B.," who considers that in this manner it is possible to obtain valuable contributions to the study of atmospheric electricity. He is of opinion that the constant noise heard in the wires proves the existence in them of a current of atmospheric electricity flowing into the earth, and that a network of telephonic lines overspreading a town would be its best possible protection against lightning.

Earthquakes and Outbursts of Gas in Mines

The recent disastrous earthquake near Naples has renewed the discussion of the probable cause of these upheavals of the upper crust of the earth. As described in a British exchange, the terrestrial crust reposes on lava, in all probability, of a declining temperature, and the solid portions formed at the surface of the crust internally are moved upward by masses of a high temperature, tending by fusion to diminish the thickness of the crust in certain places, thus producing eruptions. A similar cause and effect is stated to result from sudden outbursts of gas in coal mines, and a British mining engineer of some eminence, who has paid a good deal of attention to these phenomena, records several sudden outbursts of gas which forced up the floors of mines and continued blowing off for weeks without intermission. At one colliery the pressure, as stated, amounted to 135 pounds to the square inch. This is analogous to the effect of an earthquake, but of course on a much smaller scale. In other ways, also, there is a similarity between outbursts of gas in mines and earthquakes, more especially as regards premonitory warnings. It is a fact frequently recorded that outbursts of gas in mines are preceded by a trembling of the earth. From these circumstances conclusions may be drawn favoring the opinion that earthquakes proceed from something like the same cause as these outbursts in mines, being the pressure of pent-up gases in the earth.

THE EFFECT OF LIGHTNING ON TREES.—The frequency of thunder storms in Switzerland this summer has afforded Professor Colladon, of Geneva, a great authority on electricity and meteorology, ample opportunity of continuing his observations on the effect of lightning on trees and vegetation generally. He has ascertained that when lightning strikes a tree it leaves very few marks of its passage on the upper part and middle of the trunk, a peculiarity which he ascribes to the fact of those parts being more impregnated with sugar, a good conductor, than the lower part. As the electric fluid descends to the neighborhood of the heavier branches, where there is less saccharine matter, it tears open the bark and in many instances shivers the tree. It is no uncommon thing to find the lower part of a tree literally cut by the lightning, while the upper portion and the higher branches seem to have suffered hardly at all. Oaks, however, would appear to present an exception to this rule, for they are often found with tops quite blasted and the passage of the lightning lower down marked by a gouge-like furrow. These furrows sometimes go completely round the tree, like a screw, the reason of which is said to be that the lightning follows the cells of which the bark is composed lengthwise, and in certain sorts of wood these cells are disposed spirally.

TESTING OILS.—Rosseau has shown that the oils, with the exception of olive oil, which has nearly one seven-hundredth the conductivity of other oils, are good conductors of electricity, and has devised an instrument to detect adulterations of that oil, which is called the diagometer. The test is made by measuring their conductivity. The instruments used are simply a galvanometer and a small voltaic battery, the current of which is passed through a small drop of the oil to be tested, and its intensity is then measured by the galvanometer. A comparison with known oils gives the evidence sought. The effect of heat upon oils furnishes another means of determining their character and of detecting falsifications. The temperature of distillation of petroleum products varies from 80° to 250° F. (27° to 120° C.); for the napthas, 250° to 600° F. (120° to 315° C.); for illuminating oils, 600° to 800° F. (315° to 425° C.), for the heavy lubricating oils. The very best oils of the latter class have no bad odor, and only vaporize at 600° F. (315° C.) or higher. Their density is about 27 or 28 B. (.890 Sp. Gr.) They are rarely used unmixed with lighter oils.

A SUBSTITUTE FOR QUININE.—Professor Fisher of Munich has succeeded in obtaining from distilled coal a white crystalline substance, which, as far as regards its action on the system, is exactly the same as quinine, though it assimilates with the stomach more easily than quinine does.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Best & Belcher M Co	Nevada	27	50	Sept 18	Oct 24	Nov 16	William Willis	309 Montgomery st
California M Co	Nevada	9	20	Oct 1	Nov 7	Dec 5	C P Gordon	309 California st
Champion M Co	California	13	10	Oct 8	Nov 15	Dec 8	Theo Wetzel	522 Montgomery st
Con Amador M Co	Nevada	6	50	Sept 15	Oct 20	Nov 13	F B Latham	408 California st
Ouimpo Seco Copper Co	California	2	10	Aug 10	Oct 1	Nov 20	D Back	309 Montgomery st
Day & M Co	Nevada	13	30	Sept 7	Oct 15	Nov 12	E M Hall	327 Pine st
Double Standard M Co	California	6	10	Aug 30	Oct 5	Oct 25	G W Sessions	309 Montgomery st
Elco Con M Co	Nevada	2	15	Oct 6	Nov 12	Dec 4	F Sperling	303 California st
Eureka Con M Co	Nevada	7	10	Sept 27	Nov 10	Nov 30	A F Main	418 Jackson st
Hintracht Gravel M Co	California	13	05	Sept 11	Oct 17	Nov 5	H Kunz	309 Sansome st
Eureka Con M Co	Nevada	6	1.00	Sept 23	Oct 22	Nov 12	P Jacobus	309 Montgomery st
Gorilla M & M Co	California	2	21	Aug 23	Oct 3	Oct 31	A A Enquist	436 Montgomery st
Hale & Norcross M Co	Nevada	78	50	Sept 11	Oct 16	Nov 6	J T Lightner	309 Montgomery st
Mayflower M Co	California	20	15	Oct 4	Nov 6	Nov 22	J Morizio	328 Montgomery st
Martin White M Co	Nevada	16	25	Sept 22	Nov 7	Dec 6	J J Scoville	309 Montgomery st
McClinton M Co	California	9	05	Aug 30	Oct 4	Oct 24	G W Sessions	309 Montgomery st
Mexican M Co	Nevada	24	1.00	Sept 17	Oct 23	Nov 13	C L McCoy	309 Montgomery st
Pleasant Valley M Co	California	2	15	Sept 8	Oct 16	Nov 3	C E Elliott	327 Pine st
Ruby Hill Gravel M Co	California	9	25	Sept 3	Oct 20	Nov 12	H Pecham	320 Sansome st
Silver Hill M Co	Nevada	19	05	Sept 3	Oct 8	Oct 30	W E Dean	309 Montgomery st
San Miguel & Trinidad M Co	Mexico	3	1.00	Sept 8	Oct 11	Oct 19	C G Brooks	210 Front st
Trinity G M Co	California	1	50	Sept 15	Oct 22	Nov 6	L Wadham	528 California st
Tip Top M Co	Arizona	7	25	Aug 16	Sept 24	Oct 22	H Deas	309 Montgomery st
Wiuthrop M Co	California	1	25	Sept 17	Oct 23	Nov 16	H Wright	410 Front st
Yaqui M Co	Mexico	2	10	Sept 12	Oct 17	Nov 7	T T Atkinson	337 Pine st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	Annual	Oct 22
Commonwealth M Co		P F Mobrhardt	311 Montgomery st	Annual	Oct 24
Eureka Con M Co	Nevada	P Jacobus	309 Montgomery st	Annual	Oct 15
Exchequer M Co	Nevada	C E Elliott	327 Pine st	Annual	Oct 15
Gen Lee M Co	California	C E Gillett	334 California st	Annual	Oct 15
Happy Valley M Co	California	D M Kent	330 Pine st	Annual	Oct 24
Lima Con M Co	California	C T Johns	309 Montgomery st	Annual	Oct 25
Oakland Q M Co	California	P Jacobus	309 Montgomery st	Annual	Oct 25
Syndicate M Co	California	J Stadtfeld	419 California st	Annual	Oct 18

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Bulwer Con M Co	California	W Willis	309 Montgomery st	15	July 2
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	July 19
Mt Diablo M Co	Nevada	R W Heath	318 Pine st	25	Sept 25
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	Oct 12
Silver King M Co	Arizona	J Nash	315 California st	25	July 12

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Sept 19.		WEEK ENDING Sept. 26.		WEEK ENDING Oct. 3.		WEEK ENDING Oct. 10.	
Alpha	2.10	2.55	2.00	2.30	2 25		2.25	
Alta	1.00	1.50	1.60	1.60	1.25	1.60	1.30	1.40
Andes	.60	.70	.50	.70	.50	.55	.55	.60
Albion		.45		.45			.35	.40
Argenta							.20	.25
Atlas								
Belcher	1.05	1.15	1 00	1.05	1.05	1.10	1.15	1.35
Belding								
Best & Belcher	3.35	3 75	3.20	3.60	3.05	3.20	3.15	3.30
Bulliou	1.00	1.05		.85	.75	.80		.85
Bechtel								
Belle Isle		.30		.30		.30		
Bodie Con	.65	.95	.55	.60	.50	.60	.50	.55
Benton	.20	.25	.25	.30	.20	.25		
Bodie Tunnel								
Caledonia	.20	.25		.25				
California	.10	.20		.15	.10	.15	.15	.20
Challenge	.35	.40		.35		.35		
Chollar	2.75	3.15	2.70	3 05	2.25	2.80	2.25	2.95
Confidence		1.85	1.60	1.80		1.60	1.85	1.90
Con. Imperial								.10
Con. Virginia	.45	.55	.45	.55	.40	.45	.45	.50
Crown Point	1.20	1.40	1.10	1.20	1.10	1.30	1.30	1 45
Day						.20		.35
Elko Con					.10	.15		.10
Eureka Con	6.00	7.00		5.75	6.25	7.00	5	6.00
Eureka Tunnel		.15				.20		.10
Exchequer	.60	.65	.55	.65	.50	.60	.55	.65
Grand Prize		.10	.15	.20		.20	25	.60
Gould & Curry	2.30	2.75	2.20	2 60	2.25	2 35	2.20	2.40
Hale & Norcross	3.70	4.10	3.55	4.10	3.25	3.70	3.50	4.00
Holmes								
Independence								
Julia								
Justice	.40	.50	.40	55	.40	.55	.50	.45
Jackson								
Kentuck								
Martin White				.10				
Mono								
Mexican	2.50	3.20	2.25	2.75	2.15	2.35	2.25	2.50
Mt. Diablo	4.00	4.60	4.25	4.75				.25
Mt. Potosi								
Noonday								
Northern Belle	6.00	.61		6.00	5.75	5		5.00
North Noonday								
Navajo		2.60		.60		2.60	2.70	35
North Belle Isle		.45		.45			.40	.50
Occidental		1.50						1.50
Ophir	3.30	3.70	3.25	3.70	3.25	3.45	3.60	4.70
Overman	.40	.45		.40		.35	.35	.40
Oro								
Potosi	1.05	1.20	1.00	1.15	.85	1.05	.95	1.15
Pinal Con								
Savage	1 75	2.05	1.65	2.00	1.40	1.70	1.45	1.55
Seg. Belcher								
Sierra Nevada	3.50	4.15	3.60	4.35	3.40	3.70	3.95	4.35
Silver Hill								
Silver King	.75	4.00		7.50		7.25		
Scorpion	.60	.65	.60	.65	.50	.60	.55	.60
Tuscarora								
Union Con	4.35	4.90	4.25	5.85	3.80	4.00	3.80	4.40
Utah	1.95	2 65	1.70	2.00	1.80	2.40	1.90	2.10
Ward								
Wales								
Yellow Jacket	3.10	3.30	3.05	3.25	3.05	3.20	3.20	3.65

Sales at San Francisco Stock Exchange

THURSD. Y A. M., Oct. 11.		AFTERNOON SESSION.	
100 Alta	1.40	200 Alta	1.30
50 Alpha	2.20	100 Albion	35c
350 Andes	60c	1150 Argenta	25c
200 Bodie Con	50c	250 B & Belcher	3.25
150 Belcher	1.40@1.45	100 Belle Isle	30c
50 B. & Belcher	3.30	50 Bodie Con	55c
270 Benton Con	30c	50 Belmont	1.50
70 Chollar	3	780 Chollar	3@3 05
700 Con. Virginia	55c	715 Con. Imperial	05@10c
50 California	20c	2400 California	20c
850 Exchequer	65c	2180 Con. Virginia	50@55c
200 Gould & Curry	2 35	800 Elco Con	10c
200 Grand Prize	55c	500 Eureka Tunnel	10c
1980 Hale & Nor	3.60@3.70	50 Eureka Con	6
500 Justice	40c	165 Gould & Curry	2 25@2.30
275 Mexican	2.45@2.50	110 Grand Prize	55@60c
50 Northern Belle	5	2250 Hale & Nor	3.95@4.10
660 Navajo	3.25	100 Justice	40c
400 N. Belle Is	40@50c	100 Mexican	2.40
40 Ophir	4.80@4.95	200 Navajo	3.25
100 Potosi	1.15	850 N. Belle Is	40@50c
300 Savage	1.50@1.55	810 Ophir	4
50 Sierra Nevada	4.30	250 Potosi	1.10@1.15
100 Utah	2	980 Savage	1@1.55
550 Union	4@4 05	495 Sierra Nevada	4.35
120 Yellow Jacket	3 95@4	85 Utah	2 10
		155 Yellow Jacket	3.70@3

THROUGHOUT all the wine districts of France the crop is the finest in quantity and quality since 1858. In the champagne districts the crop is enormous and of the highest excellence.

YELLOW fever is still raging at Hermosillo, and the rate of deaths increasing. Many bodies are buried without being coffined.

Mining Share Market.

Nothing startling has occurred in our stock market this week. Our stock tables show what slight fluctuations have occurred. The *Enterprise*, in speaking of the explorations in the Union and Sierra Nevada, says it is pretty certain that a great amount of quartz will be found on the 3100 level, and should the improvement be as great between the 3000 and 3100 as it was between the 2900 and the 3000 levels, a great deal of ore should be found. That ore will be found on the 3100 level is pretty evident from the fact that streaks are now coming in at the bottom of the winze, but a few feet above said level, that assay from $20 to $50. In drifting west on the 3100 level there is every indication that ore will be found.

The Hale & Norcross folks are now drifting north and south from their 2700 station, and will soon be out far enough to start cross-cuts. When the drifts are each out 40 feet, it is intended to start two cross-cuts west. Counting the width of the station at 20 feet, these cross-cuts would be about 100 feet apart. They are now in ground of a favorable appearance. The new cross-cuts will be very closely watched by mining men.

At Gold Hill all the mines are preparing to resume the regular extraction of ore. The winter storms having now set in, there is likely soon to be sufficient water in the Carson River to allow of all the mills being run to their full capacity.

At the Alta they are fast clearing out the lower evels of water and will soon be down to the 2150 level at the present rate of progress.

Bullion Shipments.

Christy, Oct. 4th, $4,036; Northern Belle, 3d, $14,365; Christy, 8th, $3,330; Alhambra, Sept. 27th, $4,880; Mt. Diablo, Oct. 3d, $9,350; Hanauer, 3d, $3,130; Stormont, 3d, $3,020; Vienna, 4th, $1,441; Ontario, 4th, $4,580; Horn Silver, 4th, $21,000; Vienna, 5th, $1,463; Ontario, 5th, $4,296; Horn Silver, 8th, $21,000; Hanauer, 6th, $2,600, Crescent, 6th, $3,720; Stormont, 6th, $4,600; Ontario, 6th, $5,161; Vienna, 6th, $1,333; Horn Silver, 6th, $12,000; Vienna, 7th, $1,418; Horn Silver, 7th, $15,000. During the week ending October 5th, there were shipped from Salt Lake 44 cars of bullion, 1,134,120 pounds, sent East; 17 cars of ore, 362,000 pounds, sent East; 10 cars of ore, 288,030 pounds, sent West, and one car white lead, 25,000 pounds, sent West, making a grand total of 72 cars, aggregating 1,809,150 pounds.

BACKED DOWN.—About two weeks ago the Grass Valley papers stated that the long-standing $1,000 challenge of Adams & Carter, that the Frue concentrator could do better work than any other machine, had been accepted by the Hendy and Farwell concentrators. And further, that the contest would take place at the Empire mine, in Grass Valley district. We learn from undoubted authority that the contest will not take place, as the proprietors of the Hendy and Farwell concentrators have not sufficient faith in their machines to back their opinions, thus leaving the Frue in the field as the champion concentrator of the World.—*Nevada Transcript.*

THE National Bank of New Orleans has brought suit against the Postmaster-General for $100,000, for directing that money orders addressed to the bank, but intended for the lottery company, shall not be delivered. Plaintiff considers that the order was intended to charge the bank with fraudulent practices and illegal action, and has seriously damaged its business.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

SEATON.—*Ledger*, Oct. 5: This week the company paid off the liabilities, and the attachments were released. It is understood that new parties have purchased an interest, Alvinza Hayward among the number. Work on the mine has been resumed. The shaft is down 500 ft. It is the intention to sink 50 ft further. Assays of rock taken from a depth of 500 ft yielded handsomely. Although the outlook is encouraging.

NOTES.—The contractors at the tunnel at Middle Bar tried running by hand drills, but they found the rock so hard that it was impossible to make wages. The Bunker Hill mill was started again Wednesday with 20 stamps, after a period of idleness on account of scarcity of water.

PLYMOUTH.—Cor. *Dispatch*, Oct. 6: The rain has done wonders for Plymouth. The Empire mill is running 50 stamps, and just before the rain they could only get 15 stamps to go with the head of water they had. If the water continues to improve, the mill will have 60 stamps going before the week is out. It makes Reeves, the mill boss, laugh to hear the thunder of so many stamps once more.

ANOTHER RICH STRIKE.—Mr. Crannis struck a large body of extraordinarily rich rock the other day in his mine at Middle Bar on the Mokelumne River.

VOLCANO.—If the rain will continue a little while longer the gravel miners will make a start. All the quartz mines are making progress. R. C. Downs is sinking 200 ft in south shaft of his mine. We understand that he has very rich rock. Gillick & Philips are about to start up their mill, as they have 75 tons of rock which will average $35 to the ton. We have seen a specimen from the mine which will run $500 to the ton. All the mines on Pioneer are working. Jake Griesbach is getting out rich rock, also the Modoc. The Tunnel Co. have completed their new flume and are ready for water.

SUTTER CREEK.—The Mahoney mine complication is still in an unsettled state. Another agreement has been gotten up. The outside creditors, some of whom are men of means, are willing, on being secured, to advance money required to start up the mine. The water is being kept out, and every effort is being made to perfect arrangements.

Calaveras.

MURPHEY'S.—*Citizen*, Oct. 6: The Oro Plata mill will soon shut down for repairs. The prospects of this mine are flattering. On the 100 level the vein has widened to six feet, in splendid rock, assaying $12 per ton.

CALAVERAS MINE.—Tom Goodwin started the compressor in the Calaveras Mine on the 29th ult. Everything is looking well in the mine, the vein on the 400 level opening out splendidly.

NOTES.—*Mountain Echo*, Oct. 4: A piece of quartz about 10 pounds weight, was taken from the Gold Hill mine last week, which is estimated to contain over $400.

Rumor says that good ore has been struck in the Porter mine, located on Carson Creek. Some say that the ore assays as high as $200 per ton

GOLD KING.—*Sierra Tribune*, Oct. 4: Mr. Weldon located the Gold King claim by the use of his magnetic survey. There was no ledge visible where he started a tunnel. Several months ago the ledge was encountered, since which time 150 tons of ore has been taken out. Mr. Weldon states that this pile of ore will pay him for every dollar he has expended thus far. Recently a winze was sunk 18 ft. The ledge is from 4 to 5 ft in width, showing gold freely. A survey is being made for a tunnel that will tap the ledge 100 ft below.

El Dorado.

EUREKA.—*Gazette*, Oct. 5: Since the trouble with the Tasker pulverizer has been overcome, it has been working very well. It appears that the ball had been running too tight in the mill. Since the loose ball has been working, two and a quarter tons of rock has been put through the mill with a No. 40 screen in 1 hour. The amalgam is accumulating nicely, showing that the ore is yielding good returns. Some rich ore has been struck in the mine this week.

Fresno.

MT. RAYMOND.—Mariposa *Herald*, Oct. 5: Alfred Cannon of Fresno Flats was in town Tuesday. He says there is as much interest in Mt. Raymond now as there was 6 weeks ago. It is believed that George Hearst wants to secure a number of claims, and so speaks unfavorable of the mines. San Pedro, however, has men at work taking out rock. He says he will prove that he was not exaggerating when he pronounced Mt. Raymond the biggest silver discovery of recent years.

Inyo.

CLOVER PATCH.—*Independent*, Sept. 29: M. G. Nixon, was in town during the week. He sold his interest at Darwin in the Defiance mine and furnaces, but will not leave this section. J. M. Nicholson accompanied him. The property consists of the Banner mine and the Wild Rose mill, situated 7 miles south of Benton. The mine has been well developed, and is already credited with a yield of $50,000. Mr. Nixon will start up the mill within the coming week.

Mariposa.

NUMBER NINE.—John Mitchell writes the *Gazette*, Oct. 6: Between the 2 shafts, several thousand tons of ore have been taken out, which paid in free gold from $7 to $15 per ton, and I venture to say there is at least 20,000 tons yet remaining between these shafts that will mill $7 per ton, which can be dropped at the mill for $2 per ton.

Mono.

STANDARD CON.—Bodie *Free Press*, Oct. 2: During the week there were shipped to the mills 1051 tons of ore. The bullion shipment was valued at $38,233.72. The east cross-cut, 1200 level, was advanced 13 ft. South drift No. 2, 1000 level, was run 11 ft; total length 325 ft, showing 5 ft of vein.

BODIE CON.—During the week ending the 29th 137.45 tons of ore were sent to the mill. The assay value of the pulp was $50.45 per ton; that of the tailings was $5.87 per ton.

BULWER CON.—The west cross-cut from the north drift, 700 level, is in 485 feet; progress during the past week 10 feet. The ground is hard. North drift, same level, was run 8 feet.

KENTUCK.—Between $18,000 and $20,000 per month is being taken from this mine. The ore assays high. The small mill is kept in operation night and day.

Nevada.

CENTENNIAL.—*Transcript*, Oct. 4: Since the storm the surface water has been pouring into the shaft of the Centennial so fast that the machinery could not control it, and further sinking has been postponed while 70 ft of tunnel is being run. This tunnel will carry off the surface water, and the shaft can be pushed down without delay.

HUSSEY.—*Tri-Weekly Herald*, Oct. 6: John Hussey, of You Bet, has purchased a one-half interest in the Hussey quartz mine at Willow Valley. The property promises to be one of the best in the district.

Placer.

DAMASCUS.—*Cor. of Herald*, Oct. 6: The Hidden Treasure is the boss mine at present. They employ about 90 men, wages $3 per day, and it pays a handsome dividend every month to its owners. The Mountain Gate Mining Co. are sinking a new shaft at the far end of the lower tunnel and about 800 ft from the present incline. When completed it will be 50 ft deep. A large overshot wheel will be used to pump the water and hoist the dirt. It will take two or three months before much pay can be taken through the new works. The main tunnel is 7,200 ft, and the gravel channel 300 ft wide, no doubt continues on to the celebrated Hidden Treasure mine on the other side of the ridge. Farther up the divide is the Golden Fleece, Hogs-back, Black Canyon, Greek Claim, and others too numerous to mention, all expecting big things in the future.

ALTA.—Dutch Flat *Times*, Oct. 6: The Alta Placer Mining Co. have organized and gone to work. They are now sinking a shaft which will probably reach the bottom at a depth of 220 ft, with a fair promise of favorable results. It is well known by miners generally that the location covers the junction of two extensive gravel channels. It is only a question of time to develop the great wealth that lies buried in these ancient river channels for many miles to the east, and also west to Dutch Flat.

San Bernardino.

CALICO NOTES.—Calico *Print*, Oct. 6: Work is progressing on the Blackfoot, and fine ore is being taken out. Mr. Sinclair has resumed operations on the Mountain View. Burke & Hutchins are taking out ore from the Sam Houston No. 2. The Taggart mine has closed down for the present. The Oriental has closed down and the hoisting works are removed. The last we heard from the Cuba No. 1 boys, they were making their work pay. Work is progressing on the Snow Bird; good ore is being taken out. The King mine has sixty men at work and is progressing in first-class order. The bullion shipment still remains about $12,000 a week.

Sierra.

RICH QUARTZ.—*Messenger*, Oct. 6: Rich quartz has lately been discovered in the Fisher & Bros. ledge on the east branch of the South Fork, two miles above Sierra City. Several specimens valued at from $10 to $250 have been found. Streaks of gold a quarter of an inch thick seam the quartz. A tunnel is being run on the ledge, and the vein is from 18 to 20 inches wide.

SWALLOW.—The Swallow Co. has received $1,100 of the $1,500 for which they sold their tailings. The Co. has let a contract to run 200 feet of tunnel, for the purpose of reaching a back channel which has been worked by the Exchange Co.

GIBSONVILLE.—Cor. *Messenger*, Oct. 6: Union Co. have been working with an incline. Gravel averages $2 per carload. But just enough water now to prospect. Their main tunnel is 4,000 ft long, with but two turns, like that of the Bald Mt. Extension, Forest City. Gravel is carried out this distance by Chinese carmen. Forty men are employed. Fully 10,000 carloads of gravel in the dump awaiting water. Nine hundred carloads a day are being rolled out. Last spring, $26,000 in coarse gold, assaying 935 fine, was sluiced out. Incline is 100 feet long and 30 feet perpendicular. The cost of pumping at incline per day $11. Hooker pump used. Gold worth at mint, $19; sells at Wolter Bros. for $18.25 an ounce. Largest nugget found here weighed 80 ounces. There are 1,000 feet of flume. The Union tunnel was started in '56 and has been almost continuously worked.

Trinity.

SPECIMENS.—*Journal*, Oct. 6: From John E. Gibson, of Deadwood, we have received several pieces of splendid-looking quartz, some from the Enterprise, at 50 and 185 ft, and some from the Black Bear, 70 ft below the tunnel or 430 ft from the surface. Rowles & Diener send us some rich specimens from their Skidmore mine on the forks of Buckeye, on which they have a tunnel 70 ft. We learn that an assay of this rock returned $107 to the ton.

Tuolumne.

BONANZA POCKET.—*Independent*, Oct. 6: The papers of Amador have made a big breeze about the pocket recently come upon in that place, and claimed for it the largest amount of gold ever taken out at one time in California—the sum being $100,000. The Clark & Bray find in Sonora, or the "Bonanza Pocket," so called, turned out 960 pounds of gold, which coined in the neighborhood of $198,000; since which time, from $75,000 to $100,000 has been taken out.

LUCKY MARCUS.—There are rich veins at Sawmill Flat, about Bald Mountain. Antone Marcus recently got six ounces to the pan from a lead about 5 or 6 inches wide, which runs from Sawmill Gulch into Bald Mountain.

TIOGA.—*Democrat*, Oct. 6: From a gentleman who has just returned from Tioga the *Union Democrat* learns that the prospects for that camp are bright. The tunnel of the Great Sierra Mining Co. is in over 1000 ft, and it is expected to tap the Mount Dana and Sheepherder ledges by the first of January. Several small stringers have been cut, some of them carrying fine galena.

HOLMAN.—Mr. S. H. Teeters exhibited at the *Democrat* office some exceedingly rich quartz, showing free gold and sulphurets, from the Holman mine in the Sugar Pine district. Mr. Teeters is down on

the Holman 60 ft. The vein in the bottom is 6 inches in width; all fine milling quartz.

WEBSTER.—We learn from Major Phil. Stoner that the Webster Mine at Yankee Hill is showing up well. The shaft is down 40 ft with a ledge of first-rate milling quartz eighteen inches in width in the bottom.

THE LAMPHIER.—An incline shaft has been sunk to a depth of 165 ft on the ledge. In the bottom the ledge is 3 ft thick, all solid milling quartz. From the bottom of the shaft a drift is being run north on the vein. This drift is in 30 ft, with 20 inches of very rich milling quartz in the face, much of it showing heavy sulphurets. On the dump is a large quantity of quartz which will mill $45 to the ton just as it comes from the mine

NEVADA.

Washoe District.

UNION CON. - *Enterprise*, Oct. 6: The joint Sierra Nevada winze below the 3000 level is nearing the 3100 level. The bottom shows a stratum of quartz, which is dipping to the east at an angle of 75 degrees. This quartz has the appearance of being part of a solid deposit of considerable size.

OPHIR. Good progress is being made in the several exploring drifts on the 150 level. In running these, some ore is being saved for milling, but regular mining has not yet been commenced.

YELLOW JACKET.—The exploring drifts on the Sagebrush level are making good progress. In running these, some good ore is being found and saved for milling. No regular mining is yet being done.

MEXICAN.—The connection between the raise from the 2900 and the winze down the 2700 level has not yet been made. The raise appears to be too far east to strike the bottom of the winze. The main north drift on the 3100 level is in ground that continues favorable.

HALE AND NORCROSS.—The drifts north and south from the 2700 station will each be extended about 40 feet, when two west cross-cuts will be started and simultaneously driven into the vein.

CROWN POINT.—Work is being resumed in the upper levels, and as soon as the mills on the river start up, a full force of men will be set to work.

ANDES.—Some good ore is being extracted from the streak of quartz lying upon the west wall in going north. Are drifting north and south from the bottom of the winze.

SIERRA NEVADA.- On the 2900 level the main north drift in progressing at the rate of 20 ft per week.

GOULD AND CURRY.—On the 2500 level east drift No. 3 is making over 50 ft per week. The ground is not so hard as it was last week.

CALIFORNIA.—Since setting up the hoisting engine more rapid progress has been made in sinking joint Con. Virginia winze No. 2.

CON. VIRGINIA.—More rapid progress has been made in sinking joint California winze No. 2 since the setting up of the hoisting engine.

SOLID SHAFT. - During the last week the miners have been fixing up and repairing the timbering.

ALTA.—The water is out to a point below the 1800 level, and still continues to be lowered rapidly.

UTAH.—The north drift on the 1350 level is being pushed ahead at the rate of 30 ft per week.

SCORPION.—The west drift on the 500 level is in ground of a favorable character.

IMPERIAL.—Are preparing for the opening up of the old levels of this mine, the Alpha and the Exchequer.

COMBINATION SHAFT.—The big station for the new hydraulic pump at the 2600 level will soon be completed.

OVERMAN.—Are extracting some very good ore from the old upper levels.

UNION SHAFT.—Are still engaged in easing timbers at the 2300 station.

BELCHER.— Are preparing to resume the extraction of ore.

Belmont District

BELMONT MINE.—*Courier*, Sept. 29: Official report of Supt. is as follows: Shaft No. 1 in Laity ground is being pushed down rapidly and showing good ore. All the stopes in this as well as Moore & Martin ground show splendid ore. Track is being laid in south tunnel preparatory for hoisting ore. Shall commence hauling ore to mill to-day. Mill repairs progressing well. Expect to start the mill about the 10th.

Bernice District.

LOVELOCK.—*Silver State*, Oct. 1: Our Lovelock correspondent writes that C. W. Gilbert, just in from Bernice, reports the camp lively. In consequence of the scarcity of water the mill is running only on half time, but for all that, Supt. Bothwell has a bar of bullion ready for each stage. As soon as rain falls it is expected that there will be water enough to run the mill steadily.

Candelaria District.

NORTHERN BELLE.—*True Fissure*, Oct. 6: The streak of sulphurets in the southwest drift on the fifth shaft level has improved somewhat in width, and a stope has been started. The main cross-cut on the same level continues in very hard quartz, and has advanced 10 feet. The new cross-cut on the fourth shaft level has been extended 10 feet, making its total length 31 feet. The stope on this level is producing some very good ore, though limited in quantity. The total bullion shipments amounted to $30,839.65 for the month of September.

MOUNT DIABLO.—The drift from lower winze No. 2 has developed some 10 inches of $40 ore. The stope from this winze shows some improvement, and is giving considerable $60 ore. The stopes below the third level, near winze No. 1, are yielding a good deal of $50 ore. The stope above the west drift on the third level is giving some $40 ore from a wide ledge. A bullion shipment was made September 27 of $4,962.67, and one on October 3 of $9,350.36 making a total of $51,708.74 on September account.

COLUMBUS CON.—All work in this mine during the week has been followed by good results. The connection lately made between the new shaft and the Bonanza winze has proven to be of great advantage. When sinking was resumed in this winze, it was down to a depth of 83 feet. It has now reached 107 feet. The bottom shows streaks of very rich ore.

Eureka District.

EUREKA CON.—*Sentinel*, Oct. 7: This mine was looking better yesterday than for the past twelve months. The recent development on the 1200-foot level has gradually improved. Other parts of the mine, worked through the old shaft, have also brightened materially during the week. The developments in the K K ground continue with cheering results. Yesterday the pump was again lowered in the Locan shaft to within 28 feet of the drift, although the water stands at about 58 feet. If no accident happens to the machinery, it is thought the flood can be reduced to the pump-level within a few days.

NOTES. *Sentinel*, Oct. 4: Richard Berryman, from the Fair Play mine, is awaiting settlement for ore shipped to the furnaces. Uncle Dan Hall has a magnificent specimen of ore from the Sunset mine on Prospect Mountain. It is heavy with lead, and very rich in gold and silver. Graham & Co. are sinking the new shaft on the Page & Corwin mine, Secret Canyon. Not only are the indications good, but small bunches of good ore are daily encountered. Martin Piantoni reports the Dead Broke mine looking well. He has made two new strikes during the week; the ore, although in no large bodies, is exceedingly rich. In the mines on Adams Hill and Prospect Mountain, there are hundreds of thousands of tons of what is known to the furnace-men as dry ores, containing little or no lead, that will yield from $20 to $30 per ton in gold and silver. Eighty-five tons of ore was shipped during last month from the Silver Connor mine on Prospect Mountain, to the Eureka Con. furnaces. It yielded at the rate of $37 per ton, $28 of which was gold. The owners received for it $18 per ton, which left them a good margin after all the expenses of mining, etc. were paid.

Pioche District.

MENDHA WORKS BURNED.—*Record*, Sept. 29: The works at the Mendha mine, the property of the Day Co., at Highland, nine miles from Pioche, were destroyed by fire on Tuesday. It is supposed that the fire was caused by the forge in the blacksmith shop. It was thought that the men would be able to get down into the mine on Friday, and learn what damage had been done by caves, if any. The hoisting works were good substantial buildings, having been erected a little over a year ago. The destruction of the works will occasion some little delay. If it had not been for the mine having two shafts, the men in the mine would have been smothered.

OSCEOLA.—Ward *Reflex*, Sept. 25: This mill will certainly drop stamps before snow flies. Between 10 and 15 men were to have been placed to work in the mine on Friday, and more will be put on as fast as room can be made for them. About fifty men will be employed. The hoisting works are well under way.

Railroad District.

BULLION.—Elko *Free Press*, Oct. 5: One of Yeates' teams arrived from Bullion, Railroad District, this morning, with 85 bars of bullion, weighing 8,180 pounds. Another team is expected to-night or to-morrow morning with about 20,000 pounds of the bullion. This is the first run from the new furnace, which is working splendidly.

Tuscarora District.

NAVAJO.—*Times-Review*, Oct. 5: The air compressor now being erected at the Navajo mine, will effect a radical improvement in the system by which work in the Navajo, Belle Isle and North Belle Isle is conducted. A drift is being run from the North Belle Isle to connect with the Belle Isle, and when completed, there will be continuous connection along the entire line of the three claims. Pipes will be laid along the entire length, and Burleigh drills will be worked by the same power by all. The connection will be made by the end of the present month.

WHITE ROCK.—*Times-Review*, Oct. 1: B. Wisker, prospecting at White Rock, has made a number of locations. One in particular, the "Monarch of the West," which had been located and abandoned, shows up remarkably well. Mr. Wisker ran an open cut about 70 feet from where the first locators did their work, and struck a vein of rock, eighteen inches in width, through which mineral is uniformly dispersed, and which from appearances will assay well in silver. The ledge is nearly eighteen feet in width on the surface.

GOOD HOPE DISTRICT.—There are fifteen men employed, and all are satisfied with the prospects. The Con. Buckeye, owned by Dallas & Hainc, is leased for a term. The shaft has been sunk 50 feet and 150 tons of ore milled, some of which worked upwards of $300 per ton. The Patience mine is producing a considerable amount of high-grade ore. The Golden Era is producing some very fine ore. The ledge is narrow at the surface but is widening uniformly. The Big Muddy has a perpendicular shaft of 60 ft, showing at the bottom high-grade black sulphuret ore which assays from $100 to $900 per ton.

ARIZONA.

PINE SPRING MINE.—*Miner*, Sept. 28: From Mr. Wm. R. Morgan, one of the owners, we learn that the original shaft on this mine was carried down 102 feet, which was as far as it could be carried with their present hoisting machinery, and they are now running a drift south at the 72-foot level. Here the ore is a heavy wire-silver; specimens thus far obtained are very high grade, and go to show that the output excels in richness anything heretofore discovered in this section. Work is being actively pushed with all the force at command.

NOTES.—*Courier*, Sept. 28: A concentrator is being put up by the Howell company at Lynx Creek. Henszey and McCann were in town yesterday from Turkey Creek. Mr. Henszey is pushing work on the Goodwin mine, and Mr. McCann is developing the Yankee Boy. He has sunk a twenty-foot shaft, and has struck a streak of ore which assays $2,000 to the ton. The United Verde smelter is running at its fullest capacity. A large body of copper ore was unearthed Monday in the Belle mine. The ore assays very high. A big rush is being made for the White Mountains, Apache County, where rich gold discoveries have been made. Smith and Mishler, of Lynx Creek, will leave for the new bonanzas this week. The mountains are 180 miles east of Prescott.

THE MANZANAL.—Tombstone *Epitaph*, Sept. 28: The mill is on the Sonora River, 45 miles south of the line. It was erected one year ago. The Manzanal mine is on the east slope of the range of mountains from which it derives its name, five miles from the Sonora River. The Manzanal was discovered, or rather re-discovered (for it is an old mine and bears evidence of having been worked in bygone ages), about three years ago. The main shaft is down 100 feet, from the bottom of which they are drifting along the ledge. The ore is principally chlorides, being liberally sprinkled with native and horn silver, and is absolutely free-milling and containing a trace of copper. Mr Martin, lessee, brought up with him the second shipment of bullion since the starting of the mill, and the result shows an average of more than $200 per ton for the ore thus far reduced. Like nearly all the old mines of Sonora, the Manzanal has a traditional history, which in this instance has been preserved in the archives of the Catholic church at Magdalena. According to these ancient records, some two centuries ago the Manzanal was the richest mine in Northern Sonora. It was worked by the old Spanish padres, and yielded an immense amount of bullion. But these early workers were attacked and driven off by the Apaches.

COLORADO.

GOLDSMITH.- Denver *Tribune*, Sept. 26: The most important strike of the season has lately been made in the Gold Belt. The strike was made in the Goldsmith mine, and discloses a body of mineral fully 25 ft wide from wall to wall. Of these 25 ft of ore, 15 to 22 ft retain their old characteristic gold-bearing quartz, oxidized and mixed now with cubes of sulphide of iron, while about 6 ft lying nearest the hanging wall is as fine smelting ore as ever this camp produced. The ore is a fine grained milky white quartz completely honeycombed and very brittle. It carries sulphide of lead and carbonized lead. The amount of lead varies from 29 to 68 per cent. Besides this, it carries gold, as per tests made this week at the German assay office: From 3½ to 13 ounces of gold and from 35 to 60 ounces of silver per ton.

INDEPENDENCE.—*Miner*, Sept. 29: Mr. J. P. Williams, for a test, brought down a sack of ore from the bottom of the shaft of the Independence mine, East Argentine, last Monday. It ran 70 ounces in silver and half an ounce in gold. There is a 12-inch streak of iron ore, which carries on the foot wall the ore above tested. An assay from a point a few feet higher up, gave 11½ ounces gold and 569 ounces silver per ton. There are some 12 men leasing in different parties on this mine, and all have paying ore.

CALUMET AND HECLA.—The *Tribune* says of this mine: We note by its last report, for the year ending May 1, that in the 12 months prior to that date, it spent no less than $1,250,000 in mining land. It is no wonder that the stock sells at $246 a share on $25 paid in. The managers of the company understand their own interest, and are far-seeing, sagacious men. They have paid over $23,000,000 in dividends, and a steady adherence to their present far-sighted policy will probably enable them to pay as much more hereafter.

IDAHO.

MORTON.—Wood River *Times*, Sept. 26: The transfer of the interest of 1,000 ft in the Morton mine, in Lee's Gulch, five miles south of Hailey, has been made. The price to be paid is at the rate of $30,000 for the whole mine. Messrs. Scott & Price intend to work the property for all there is in it, and to either knock the bottom out or make a mine. They are experienced mining men.

ROCKY BAR.—Mr. Richter, manager of the Alturas Co., has struck a new vein of rich ore, which is 3 ft to 3½ ft in width, and stripped for 35 ft along the vein. About 200 tons of this ore, that will yield an average of $100 per ton, is on the dump; extracted during the past 10 days.

ATLANTA.—Idaho *World*, Sept. 28: Another rich strike has been made in the Atlanta mine—fourth level. The company talks of sinking 100 ft deeper in main shaft, which is now down 400 ft. A force of 25 men are at work in the Leonora mine. The machinery of the company's 20-stamp mill is going up. The Last Chance mine is working 40 men, and their stamp mill is running constantly. The Buffalo Co., which suspended operations sometime ago, will soon sink 150 ft from surface to connect with main shaft in tunnel below. We will soon have 6 20-stamp mills running in this camp.

BANNER.—The Banner mill turned out $12,600 from the 12th to the 19th instant. Nine bars were molded, valued at $1,400 each. Ore rich in horn-silver has been struck in the east drift in the Banner mine.

SHEEP MOUNTAIN.—The Daily boys have had 30 tons of ore from their mine smelted at Bayhorse this season, and it ran up to 126 ounces per ton. The ore was taken from a 2-ft vein of galena, which is of uniform richness. There is 8 ft of red dirt alongside the vein that runs $80 per ton the lowest, and assays have been made that ran up to 140 ounces. It is the intention to put up a smelter early next season.

SAWTOOTH.—The Silver King, near the Pilgrim, was lately sold for $125,000. The Minnie Alto, joining the Scotia, had mill tests made of 8 tons first-class and 5 tons second-class ore at the Columbia and Beaver mill, the lowest going 442 ounces. The ledge is small but very rich. The Wire Silver, which adjoins the well known Lucky Boy, has a 10-inch vein from which assays have gone up into the thousands. We were shown a large block of the ore yesterday, very rich in black sulphurets and ruby silver, which we were assured would assay nearly $4,000 per ton.

MONTANA.

ANACONDA.—Butte *Miner*, Sept. 29: The immense smelting works are being pushed to completion as rapidly as possible, and Supt. McCaskell hopes to have them enclosed before the severe winter weather sets in. The main building will be seventy feet high in the center, and will inclose all the matte floors and furnaces—matte cars. The fifteen large stacks are looming up in stupendous proportions. The two calcium furnaces are each to be ninety feet high.

GRANITE MOUNTAIN.—Helena *Herald*, Sept. 29: This mine, near Philippsburg, is largely owned by St. Louis capitalists, who were on the point of abandoning operations, when all at once the workmen broke in upon the displaced vein, which since has proved to be a veritable bonanza. Developments since have exposed an ore body of the average width of five feet for a distance along the ledge of 730 feet, the quality of the ore being very rich. The Algonquin mill, under contract, is working continuously on the Granite Mountain output, handling twenty tons per day and turning out $4,000 in refined bullion every 24 hours. Ruby ore abounds throughout the ledge, and the ore averages 200 ounces to the ton.

TIDAL WAVE.—Cor. of *Inter-Mountain*, Sept. 28: Nearly all the leads are represented and work is progressing, for the miners, in anticipation of the starting up of the new 20-ton smelter, are anxious to get out ore, as they can sell it to the smelting company as soon as extracted. Several mines have been bonded and are being worked. Among those bonded is the Silver Lion. The party working this mine have fifteen tons of ore on the dump, that will average 200 ounces. The Tidal Wave mine is the oldest discovery. A large pocket was struck last week, and one man took out 243 sacks of ore in six days. The ore will average 200 ounces to the ton.

LEXINGTON.—The Lexington, owned by a French company, with head office at Paris, is developed by a 500-foot shaft. The mine produces 60 tons of ore per day of milling character, which requires chloridizing. It pulps $55, of which 5 per cent is gold. There is enough ore in sight above the 400-foot level to last two years. The first dividend of 1,000,000 francs was paid on July 1st. During the first six months of this year the bullion produced realized $638,458. The mill consists of 60 stamps, 50 of which are running on ore and 10 on salt, all of which is dry crushed.

NEW MEXICO.

LOST PLACERS FOUND.—Las Vegas *Gazette*, Sept. 26: At last the lost fields are reported found, and last night about 12 o'clock, parties started from this city on horseback, heading for the White Mountains, where the placers are supposed to be. Word came in from Camp Fleming that one of the lucky finders arrived in camp with about one-half pound of gold nuggets, and the excitement spread with the report, and the town is nearly depopulated. Provisions left this morning in wagons, following up those who left last night on horseback. Other parties are making preparation to follow as soon as possible.

BULLION MINE.—Kingston Cor. of *Tribune*: The Bullion will ship a car-load of ore from Nutt the present week. Large quantities of high-grade ore are being extracted, three ore sorters being kept constantly at work. A new hoisting shaft will be commenced shortly, on the contact about 200 feet south of the present workings. Hoisting machinery will be erected at the new shaft as soon as sufficient depth is gained. The new boiler and pumping machinery is in place on the Superior mine, and will be fired up in a few days. A large quantity of ore is already sacked and awaiting shipment.

LAKE VALLEY. The air shaft connecting the two new shafts on Bella mine has been completed, and exposed to view a face of ore thirteen feet high, top and bottom of which has not yet been reached, and fifty feet long. From these shafts, some four car-loads of ore have been shipped, and there remains on the dumps at this time about two hundred tons. Again, developments have in two cases shown places, where good ore has been walled in and covered by broken limestone, by parties who previously worked the mine. An entirely new Board of Directors will at once be elected.

OREGON.

NOTES.—Jacksonville *Times*, Sept. 28: Anderson & Wells are interested in quartz ledges in the Siskiyou mountains, near the state line, and will prospect them at once. Simmons & Co. are engaged with their mining enterprise near Waldo, probably one of the most important in the state. A copper excitement has again started up in Josephine County. Wimer & Sons of Josephine County are enlarging their ditches and flumes and expect a giant of the latest pattern and 1,400 ft of hydraulic pipe in a short time. N. DeLamatter of Kerbyville is getting his claims, in readiness and will mine on a more extensive scale than ever next season. I. T. Bryan, who is mining on Brush Creek, Steamboat District, has been getting $2.25 a day with a rocker.

UTAH.

LITTLE COTTONWOOD.—Salt Lake *Tribune*, Oct. 3: The Flagstaff is working a few men. The Emma is at work with a good force, and the vein shows well. Capt. Morrill is pushing his mines ahead well and profitably. Wagner, in the Moltke mine, has struck rich ore in paying quantities. City Rocks is at work with a full force, and is showing as well as ever. Altogether Cottonwood promises fairly to be a lively camp again. The Evergreen is at work with a force of men, at a depth of 300 ft, taking out good ore.

The *Tribune*, of the 5th, in compliance with the request of a correspondent, makes the following correction: "The ore referred to above came from the Eureka mine, adjoining the Scotia. The Minnie Alto is hardly known in the district, and has never produced a ton of ore."

WASHINGTON.

THE NEW MINES.—Cor. Nez Perce *News*, Sept. 27: The excitement is for the east branches of the north fork of the Coeur d'Aleve River. The diggings are 47 miles from the old Mission. There are but four claims opened as yet, and they are paying from $10 to $25 a day to the hand. Prichard Creek, for 15 miles, prospects about the same. By going down in the bedrock you can obtain from 10 cents to $1 to the pan. On claims I located I raised bedrock 18 inches under water, and from the clay adhering to the rock obtained 80 cents to one pan. There is but little gold in the gravel. That the camp will prove extensive I have not the least doubt. In fact it is my belief the camp will give employment to more men than any camp struck since Boise Basin was discovered.

The Virginia *Enterprise* gives later news from the new mines. The excitement is at fever heat at Spokane Falls, and many are preparing to go and spend the winter in the new mineral region. The gold is reported to be coarse, nuggets found ranging in value from $2 to as high as $40. Those who have been at work are reported as averaging from $20 to $30 per day, with only the most primitive tools and processes.

A SCIENTIFIC chemical compound that gives health and strength is Brown's Iron Bitters.

The Bassick Ore Deposit.

(CONTINUED FROM PAGE 226.)

and bowlders of all sizes, including, also, fragments of charcoal, was swept by surface drainage. Metallic solutions then came from below, coated each bowlder with ore, and cemented the whole mass firmly together.

Objections.

My objections are these: The theory requires the existence of definite vein walls. The transition from the bowlder formation to the solid country rock should be sharply defined. We find the contrary to be the case. The transition is exceedingly gradual. The presence of the charcoal, according to Newberry, proves that the bowlders have been washed in from the surface. One word about this charcoal. All observers agree in using the term "charcoal," instead of "lignite." The difference between the two is an important one. Lignite is formed from wood by a slow process at ordinary temperatures, and retains a large proportion of volatile hydrocarbons. Charcoal is produced from wood by a quick process, at high temperatures, and all of the hydrocarbons is eliminated. Lignite is very commonly formed by processes that are now, and have always been, active; in fact, it may be generally stated, that the moment woody tissue ceases to live, the process of lignitization sets in. Were the Bassick substance lignite, I could not object to its being derived as drift material from the surface.

The formation of charcoal demands exceptional conditions. Previous to the advent of man and his discovery of fire, I can conceive of but two natural processes that could produce it, viz: melted lava and conflagration produced by electric discharges. The former process would never yield drift charcoal. Lava would inclose most of the wood with which it came in contact, and whatever pieces of charcoal might be produced on the borders of a lava stream in a dense forest would not stand transportation in running water, but would rapidly be ground to the finest powder, because of its brittleness and friability. The possibility that charcoal may be produced by forest conflagration resulting from electric discharges, I will not deny. I believe it to be of comparatively rare occurrence, however. It must be considered as looking to a remote source for the Bassick charcoal. Such charcoal, furthermore, would not bear transportation with drift material, and we should not have explained the occurrence of charcoal imbedded *in* trachyte.

Newberry's theory fails, therefore, to account for the gradual transition of bowlder structure into solid country rock, and it is compelled to resort to peculiar conditions to account for the charcoal.

Grabill's Theory.

Mr. Grabill's theory may be called the "Geyser theory." According to Mr. Ewer, of the MINING AND SCIENTIFIC PRESS, it is also held by Mr. Smith, the Colorado State Geologist, and in fact may be said to express the popular view of the matter. According to this theory the present ore deposit has been the scene of action of a gigantic mineral spring, or boiling geyser, carrying the ore minerals in solution. The boiling motion of the water caused the fragments which fell into the geyser hole from the walls to be rounded and polished by grinding with much friction against one another; subsequently they were coated with ore by depositions from mineral solutions which continued to come up from below. Mr. Grabill confesses himself unable to explain how the separate bowlders were supported apart from one another while the ore shells were being formed about them. He explains the presence of charcoal near the surface by supposing that trees grew on the edge of the geyser hole, were undermined, fell in, carried into the depths, and there, by some mysterious process, converted into charcoal. The presence of charcoal five, six and seven hundred feet below the surface he considers a profound mystery.

Objections.

This geyser theory leaves many important features of the deposit unexplained. It does not attempt to bring into genetic relation with the ore body itself the gradual transition of the bowlder formation into the solid country rock. It confesses itself unable to account for the charcoal in the depths of the mine, and its explanation of that nearer the surface will not hold. It is simply inconceivable that charcoal could be produced under water at the temperature of a boiling geyser. Finally, we do not need the boiling and swirling motion of the geyser to account for the rounded bowlders.

Ewer's Statements.

The statements concerning the deposit collected by Mr. Ewer at Denver, and forwarded to the MINING AND SCIENTIFIC PRESS, are farthest from the truth of any yet made. They represent the bowlders as nearly spherical, and thoroughly water-worn fragments of all the rocks of the neighboring country, granite, porphyry, limestone, trachyte and sandstone, interspersed with loose sand, and with here and there a water-worn bowlder of pure ore.

This popular misconception of the character of these bowlders is founded upon the differences in color and texture produced by different stages of decomposition and disintegration of the *same rock*, a misconception that is all but universal in the minds of those who have not made the subject a careful study. Of course, any ideas of the genesis of the deposit founded upon such a fundamentally wrong premise must be far from true ones.

Rafter's Theory.

Mr. Rafter's theory is expressed in a few words, in the New York *Daily Graphic* for August 28, 1879. I should not advert to it were it not so close to what I conceive to be the true explanation. It is, briefly, this: The bowlders within the ore-body are of different rock from the trachyte forming the country rocks on the south and north sides. He considers both to be trachytes, but bases his distinction upon a difference in texture.

First an open fissure was formed. This was filled with a new trachyte, which solidified. Later disturbances fractured this second trachyte, breaking it into fragments of all sizes. Mineral solutions from below then rose through this fissured zone, corroding and rounding off the sharp, angular corners of the fragments, producing the bowlders, and depositing, simultaneously, the ore in concentric shells. Mr. Rafter makes no further statement concerning his theory; gives premises in no greater detail than I have here stated them in connection with his views; is apparently unfamiliar with many of the most important structural details, as developed subsequently in Mr. Grahill's paper; makes no mention of charcoal, the occurrence of which, perhaps, more than anything else shaped the views of both Newberry and Grabill; and finally, does not seem inclined to adhere very strongly to his own suggestions.

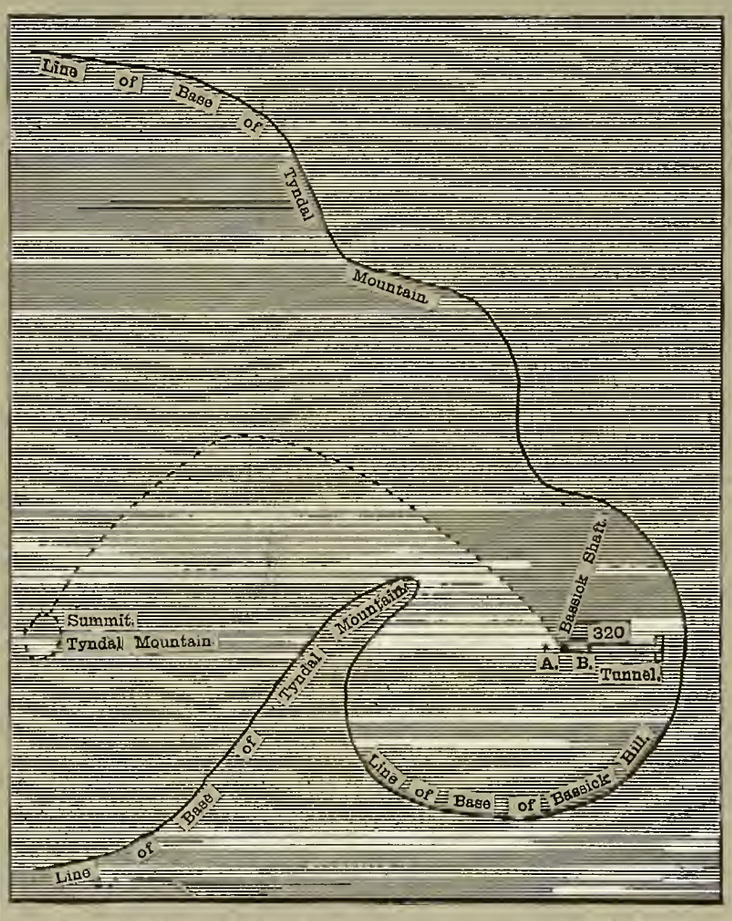


Fig. 3.—BASE LINE OF TYNDAL MOUNTAIN AND BASSICK HILL.

How remarkably close he came to what I conceive to be the true explanation, will appear upon the statement of my own views and the evidence upon which they rest.

Jackson's Theory.

I will first suggest an explanation of each of the more notable features of the deposit, and then sketch briefly the succession of events in the order in which they occurred resulting in the formation of the ore body as we now find it.

Charcoal.

First as to the charcoal, there can be no question that it is not *drift* charcoal, but that it was formed as charcoal just where we now find it. It resulted from an overflow of igneous fluid lava, over a surface covered more or less with vegetation. As I have already said, the formation of charcoal must be a rapid process, requires a high temperature, and exclusion of air. Precisely these conditions are realized when a fragment of wood is enveloped in melted lava. My specimen shows the charcoal actually imbedded in the lava, which could only have come about while the lava was plastic; and my microscopic examination of the rock, showing the presence of glass cavities in the feldspar, and the absence of liquid cavities, and the presence, furthermore, of glassy base, proves the rock to have been extravasated as an igneous, fluid mass, *i. e.*, at high temperature, and not as a volcanic mud. The charcoal is found both within and without the limits of the ore body. There is no genetic relation between charcoal and ore. How the charcoal at times comes to be completely imbedded in the ore sulphurets, I will explain when speaking of the deposition of the ore itself. The occurrence of charcoal at various depths from the surface to below 1,000 feet, may be explained in either of two ways: Either the trachytic mass has been built up by successive outpores of lava with sufficient interval between to admit of the formation of soil and a growth of vegetation, to be swallowed up and charred by the successive lava flows; or else the charcoal formed at or near the base of the first overflow was brought to the surface, inclosed in its original matrix by subsequent dyke eruptions. The data are not at hand for determining which is true or whether both may not have been operative.

The Trachytes.

Next, with respect to the bowlder nuclei. A satisfactory examination of the material at my disposal, even in thin sections under the microscope, is exceedingly difficult, in fact impossible, to carry out, owing to the fundamental decomposition which they have undergone. The open, porous texture of the trachyte has especially invited this decomposition, which in many specimens has gone so far as to reduce the whole rock to white, pulverized kaolin. The rocks can be properly studied only by tracing up in the field the fresh, normal rock. Such normal specimens were, unfortunately, not at my disposal. Nevertheless, I succeeded in satisfactorily distinguishing at least three varieties, and hence at least three independent eruptions.

The first variety is distinctly porphyritic, with sanidine-feldspar and hornblende crystals. (It is called "porpbyry" by the miners.) The latter are for the most part dissolved away and replaced by magnetite granules. Patches of the original substance remain in a few crystals, showing the pleocbroitic and absorption phenomena, as well as the oblique extinction of hornblende, while in one case an end section showed the characteristic angles of hornblende, viz: 124° 30′, and 117° 45′. (Observed: 125° and and 118° 30′.) I shall speak of this variety as the *porphyritic trachyte*.

A second variety is entirely compact in hand-specimens, shows no porphyritically disseminated feldspar or hornblende crystals, as in the preceding case. Under the microscope, however, their sections show exceedingly minute brownish needles plentifully disseminated throughout the ground mass. Their average size is about 0.018 m. m. long, and 0.001 m. m. thick, and from this down till they can scarcely be distinguished with the highest powers. The oblique extinction and scarcely perceptible pleochroism and absorption prove these needles to he hornblende. They are present in the ground mass of the preceding variety, but to nothing like the same extent. It is quite possible that these two varieties are from different parts of the same lava flow, representing only different conditions of cooling. No special significance attaches to the view that they are of different age. The fact could only he settled by further field investigation. I shall speak of this variety as the *compact trachyte*.

The existence and absolute independence of a third variety rests upon more satisfactory evidence than difference in texture or in composition. One of my specimens shows sharp cornered disintegrated fragments of the porphyritic trachyte and the compact trachyte completely imbedded in darker colored, fresher and harder trachyte. It is difficult to gain an exact conception of the composition of this third variety, as it is so completely filled with fragments down to microscopic dimensions of the other two varieties. Hornblende is absent from my specimens. It is sufficient for my purpose, however, if we can establish its igneous character and its younger age than the other varieties. Microscopic sections show it to be an igneous rock. With an enlargement of 530 diameters, one can just detect a more or less continuous network of brownish amorphous (isotropic) base lying between the minute crystalline granules that, with lower powers, appear to constitute the entire groundmass of the rock. This is a remnant of the original fluid rock magma, which solidified before it had time to differentiate into sanidine, hornblende, etc.

The inclosed rock fragments of the other varieties and their more advanced stage of decomposition, prove that they had not only solidified, but had had time to become considerably acted upon by disintegrating solutions before the third variety had been erupted. It is consequently the youngest of them all, and I shall speak of it as the *youngest trachyte*. It is to this rock the Bassick mine owes its existence. Mr. Grabill speaks of but a single trachyte. Mr. Rafter, by means of a difference in texture, distinguishes between two varieties, one of which he places entirely within the ore body, and the other entirely without it. I have shown the existence of three varieties of at least three different ages.

The porphyritic and compact varieties are both found within the limits of the ore body. I find no ore shells adhering to my specimen of igneous breccia, the cement of which is the youngest trachyte. Mr. Farish says of it simply that it comes "from the mine." It was probably taken just without the limits of the ore body, perhaps from the first tunnel run into the hill from the south.

Bowlder Structure.

Next, with respect to the bowlder structure. It commonly happens where an igneous rock has been forced through a superincumbent rock-formation to the surface, that the older rock is broken and crushed into sharp-cornered fragments, by the mechanical force of the eruption, for very considerable distances out into the mass of the rock from the line of greatest disturbance. As this distance becomes greater, the effect of the disturbance becomes less and less marked, and finally disappears altogether. Within this zone of disturbance the entire mass of the rock is converted into angular fragments, and the internal crushing is often so great as to grind the rock into very small fragments, or even, locally, into powder. Instances of this are so common in every extensive igneous region that it is unnecessary to mention special cases.

The fragments produced in immediate proximity to the outpouring lava will be mechanically inclosed in the fluid rock-matter, and will be retained in the solidified rock, forming an igneous breccia such as I have already described from the Bassick. Furthermore, fragments inclosed in such manner will be brought from below, and thus fragments of any deeply covered rock-varieties that may differ from that on the surface may be brought to the surface and mingled with the fragments of the latter in the same hand-specimen, as I have also described as occurring at the Bassick.

The sharp-cornered fragments thus produced may subsequently be rounded by the corroding action of the mineral solutions, which follow the eruption of the youngest rock. This also is a very familiar phenomenon. At the Sulphur Bank Quicksilver deposit in Lake county, Cal., rock fragments 'originally angular' have had all their irregularities rounded off by the action of the metallic alkaline solutions of sulphides which brought to the surface and deposited the cinnabar now found between the bowlders. And here as at the Bassick mine the bowlders of decomposition in place, were pronounced by the first observers to be of sedimentary or pluviatile origin. The parallel between the two deposits extends further still. As at Sulphur Bank, so at the Bassick, the decomposition below the waterline has been an alkaline and not an acid one, whence silica has been dissolved out of the rock and deposited largely in the interstices, as a siliceous gangue, while the silicate of alumina has been left as a residue in the form of clay, and this also we find between the bowlders, "Bassick tale," as the miners call it, often highly impregnated with sulphurets of the precious metal, assaying from $900 to $1,000 per ton. In this manner then the bowlders are produced, "bowlders of decomposition in place," and not bowlders produced by the action of running water such as we ordinarily see in river beds.

Ore Shells.

Next, as to the deposition of the ore in concentric shells around the bowlders. Mr. Grabill speaks as follows concerning this feature of the deposit: "One most peculiar fact regarding this deposit, and one which I am at much loss to explain, is that the nuclei or barren fragments are rarely tangent to each other, while the

(CONCLUDED ON PAGE 233.)

Wyoming Gold Fields.

Among the passengers on last Tuesday evening's train was Mr. J. M. Charles, of this place, an old and experienced miner, who for the past year has been prospecting for gold in the Wind River mountains, northern Wyoming, 125 miles north of Green River station, on the U. P. R. R. Mr. Charles says that the veins are all true fissures, carrying free-gold quartz in large bodies. The Bullion lode, one of the richest and largest of the district, is thirty feet between walls at at its present depth of 50 feet, as has been demonstrated by crosscut drifts. The ore is free-gold and resembles the celebrated Homestake ore in the Black Hills, and averages from $10 to $50 per ton. The Anaconda is the east extension of the Bullion, and is owned by Mr. John Charles. At a depth of 30 feet, a six foot crevice with pay interspersed throughout was disclosed. The Overland, another of Mr. Charles' lodes, looks very promising at 30 feet. The Wolfe, 1,000 feet north of the Anaconda and Bullion, and parallel with them, is a tremendous vein. It prospects well, running as high as 25 to 50 cents to the pan. There are many others equally as good.

The country is not all staked off and taken up as in many other camps, but there is plenty of room for all who may wish to invest in most excellent prospects, which, with development, will undoubtedly prove bonanzas. There is but one mill, and that is at the Bullion mine. It has ten stamps and treats 18 tons per day. This little mill makes $600 a day. It and the mine are running steadily day and night.

The great want of the camp at the present time is proper mills for treating the ore, and some capital; with these, Mr Charles says, it will be a glorious camp, and one of the richest and largest ore producers in this western country. He will return in the spring and open up his claims on a grand scale.—*Georgetown Courier.*

Arizona Copper.

The Clifton *Clarion*, in an article on the probable future of the copper mines in that locality, their handsome returns to their owners, and of the several promising mining districts in that section, expresses the belief that the copper bullion output will be trebled in another year. That the *Clarion* has good grounds for the prediction, we have not the least doubt. Globe is another permanent camp that will increase its yield of copper bullion. Good reports also reach us from Ray Camp, where they are taking out native copper in considerable quantities, aside from ordinary ore. The Copper Queen, which up to this date has surpassed all other copper mines in Arizona in the quantity of bullion produced, continues to yield all the ore that the smelters can make use of. There are also some fine copper mines in the southeastern corner of Yavapai county, which ere long may be expected to contribute their portion of copper bullion in Arizona, having in sight enough ore to keep a thirty-ton smelter running four years, to say nothing about further developments. We have no doubt that the yield of copper bullion from Yavapai county, in the region of Prescott, will be greatly increased, now that the Atlantic and Pacific railway has been extended through the county. Copper mines exist in every county in the Territory, and the annual increase must be rapid and permanent.—*Tucson Citizen.*

Novel Prospecting Shaft.—From a Mr. Jackson, an old resident of the Comstock, who has been visiting in Plumas County, California, for the past year, the Reno *Gazette* learns that a novel prospecting shaft is being sunk in American valley, near Quincy. A tube of boiler iron four and one-half feet in diameter is being sunk, and is now down 228 feet, inside of which an immence plunger, weighing 1,800 pounds, with a nose or point of steel, loosens the earth, which the plunger receives through a valve, and when filled is hoisted to the surface. Whenever boulders are encountered the machinery is removed from the shaft and the miners go down and blast them out. This company, which is an Eastern one, and managed by a man who has had a large experience in the Lake Superior copper mines, and in the oil regions of Pennsylvania, by the name of Mills, except to find a rich deposit of gravel, and the material being taken from the shaft, or tube, seems to justify the belief that such a deposit exists in this vicinity. This method of prospecting for gravel mines is something new, and the result will be watched with great interest by all miners.

A Great Mine.—The gold quartz mine in Venezuela which H. C. Perkins recently left this county to take charge of as superintendent is named the El Callao. It was originally worked as a placer mine, the surface abounding in auriferous gravel of a high grade. Operations have been carried on there for a quarter of a century past. There are no drifts or tunnels, but the ore is quarried out, leaving a pit that is now about 500 feet deep. Although the workings are now lower than sea level, and a large river courses through the locality, no trouble is experienced with water, which fact causes surprise among mining men. Last year the El Callao produced about two million dollars worth of bullion, the expenses being about one million dollars. The ore pays something like $100 a ton. The owners want to reduce the working expenses, and they have no doubt secured the right man in Mr. Perkins to inangurate a more economical management.—*Nevada Transcript.*

Useful Information.

Workshop Notes.

A varnish compound of 120 parts of mercury, 10 parts tin, 20 parts green vitriol, 120 parts water, and 15 parts hydrochloric acid of 1.2 specific gravity, furnishes a good coating for iron exposed to the wet.

Among the advantages resulting from having dry bearings running coolly and smoothly are saving in power and in time, increase in capacity of machine, quiet, freedom from dirt and grease, saving of bills for lubricating material, freedom from loss from stoppages, etc.

To make gum for thick labels, dissolve one pound of gum arabic in one quart of cold water, and strain through flannel. For chemists' labels, take one pound of gum arabic and dissolve it in three pints of cold water, add one tablespoonful of glycerine and two ounces of honey; strain through a flannel, and apply with a piece of Turkey sponge, which will last in constant use three or four months—common sponge goes to pieces almost directly; lay the sheet to be gummed on a flat board, and gum over evenly.

A lacquer of elasticity, perfectly supple and not liable to peel off, is made in the following manner: about 120 pounds of oil varnish is heated in one vessel, and 33 pounds of quicklime is put into 22 pounds of water in another. As soon as the lime causes effervescence, 55 pounds of melted India-rubber are added. This mixture is stirred, and then poured into the vessel of hot varnish. The whole is instantly stirred, so that the ingredients may become thoroughly incorporated. When required for use it is thinned with the necessary quantity of varnish, and applied, hot or cold, to wood, iron, walls, water-proof cloth, paper, etc.

Silver may be kept from tarnishing by painting it with a soft brush dipped in alcohol in which some collodion has been dissolved. The coating can be removed by dipping the article in hot water, but it completely protects it from tarnish.

To stain cherry in imitation of mahogany, digest logwood chips in vinegar or acetic acid for twenty-four hours or more. When ready to use, heat the solution, then dip the wood until the suitable color is obtained.

Chimes of Bells.

Knight's Mechanical Dictionary says: "The making and arrangement of a suit of bells to constitute a perfect chime is a matter of considerable difficulty. The tone of the bell depends conjointly on its diameter and thickness, a small or thick bell yielding relatively a more acute sound than one which is larger or thinner, owing to the greater rapidity of the vibrations of the metal. The founder endeavors to regulate the diameter and thickness so as to produce a certain note in each bell of a set of chimes; but as this is difficult to be attained by the mere operation of casting, it is generally necessary to remove some of the metal afterward, to produce a perfect note, by either reducing the diameter at the lower edge when the note is too low, or reducing the thickness of the part struck by the clapper when too sharp." Spon gives the method of finding the key-note of a bell, when the diameter at the mouth and the thickness at the sound-bow (that part of the bell near the mouth which receives the blow of the tongue), are given as follows: Multiply the sound-bow thickness by 58,000 and divide by the square of the diameter. The answer is in vibrations per second. For example, the key-note of a bell with a diameter of 44 inches, and sound-bow 3.52 inches thick, is found by multiplying 3.52 by 58,000 and dividing the product (204,160) by the square of 44 (1,936); the quotient, 105.45, is the number of vibrations per second, which corresponds nearly to the note A in the first octave below zero in the bars.

Artificial Wood.—A German named Herr B. Harrass, has (it is said) discovered a new method of making artificial wood, which is likely to prove of considerable service to all manufacturers of fancy goods. Common cellulose in paper form is reduced to pulp in water, and after being strained, three parts by weight of starch and two parts of wheat or maize meal are added to it. The compound is then boiled over a water-bath in thin metal tubes, which it leaves in the form of a liquid glue. Now sawdust is added, and the whole is dried in a hot room and set to the consisteney of wood. Any shapes can be made by the aid of molds and great pressure; and any color, polish, or veneer can be imparted. It is the old patent coal and rock asphalt principle over again; and we should think could be developed to almost any extent, as the compound may be required to leave the molds all ready for the most delicate and artistic uses.

Qualities of Flour.—The color of flour delivered from rolls differs greatly from that produced by buhrs, and the cause is easily found if one closely studies the construction, mode of operation, and arrangement of machinery in the mill in which it is made. Experience shows that rolls moving at differential speed produce yellower flour than those whose motion is equal. The same principle prevails with millstones, for with well ventilated sets of buhrs, whiter flour is made than with those which run with much heat. One need not, however, exclusively attribute the difference in the whiteness of flour to the continuous and injurious heat engendered in grinding, but it depends in a measure on the quantity of middlings made, if not more, perhaps, on the bran bolted therefrom. The nutritive value of a flour depends not so much upon the kind of milling which produced it as it does upon the quality of the grain, the arrangement of machinery in the mill, and the manipulation of the miller. The better and more perfectly the grain is cleaned, so much the more is the flour free from foreign matter, and it is the more nourishing. That the flour product of rolls is whiter than that of buhrs is beyond cavil; my theory is, that, without doubt, its nourishing properties are also greater, for it is most true that the flour is freer from bran than when made on buhrs.

Sensitiveness of Infants. Dr. Gedzmer states that the sense of touch is present in infants at birth, although the faculty of feeling pain is slowly developed, and is clearly indicated only after the child has reached the age of four or five weeks; smell and taste are not distinguishable in the first, or, at latest, the second day of life; light is quickly perceived immediately after birth, but evidences of complete visual power do not appear for four or five weeks, and it is only after four or five months that colors are clearly distinguished.

Patent plastering was a novelty exhibited at a recent building exhibition held in London. It is claimed for it that it saves both time and labor. The material is prepared beforehand, in slabs which are fixed to the joists direct, with great speed, forming the ceiling at once. Thus, plastering that would occupy weeks to execute, can be accomplished by this slab system in as many days.

Dr. Venukoff, during his late journey in Central Asia, discovered the horse, the camel and the goose in their wild state. No alarm was shown by some of their number after others of their associates had been shot.

Good Health.

Sleep.

It is scarcely possible for the brain-worker, the delicate and nervous to sleep too much. Indeed I do not know what special harm could result to these classes, though the heavy, dull and naturally stupid might become more indolent and inactive, in consequence of an unnecessary amount of sleep. The former classes "work on nerve," or are constantly under the influence of excitement—are running the human machine on the "high pressure" principle, always at a great disadvantage. But the "wear and tear" of life, from whatever causes, find an alleviation in good and refreshing sleep. Indeed, it is the mission of sleep to soothe the excited nerves, to aid in restoring the jaded body and to resuscitate in general. It is during natural sleep that nature performs her most beneficent work in the removal of disease, while it is as true that the grand work of consolidation then proceeds untrammeled, the solidification of the blood—made from our food and intended for general repairs of the body—into the tissures.

It is utterly impossible to determine the precise time to be spent in sleep, the age, temperament, sex, employment, manner of life and habits of diet being so various. It is said that John Wesley was able to perform an immense amount of mental labor, living very abstemiously, and yet slept but about four or five hours daily, but it is probable that very few would survive ten years of such labors with that amount of sleep, if the usual style of living should be adopted.

Among the animals it is known that a wide difference in the sleeping habits exists. The herbivorous, sleeping at night and living on a bland food, sleep less than the carnivorous. Though the herbivora are more hardy, are longer-lived, stronger or more enduring, they demand less sleep, are less exhausted by active effort, demanding less recuperation than the carnivora.

It follows that those who stimulate, either by food, by the exciting articles of the castor or by ardent spirits, implying a corresponding waste of vital energy, demand much sleep as a means of restoring the poise of the system or of regulating its action. The frail female, if nervous, those subject to unusual cares, anxiety, excitement, annoyances, etc., so generally succeeded by depression, with all real brain-workers as clergymen and the like, demand an unusual amount of rest and sleep, and sleep under favorable circumstances. One important condition is that it be secured at night, and, as far as practicable in the early part of the night, when the birds secure theirs, though it may not be strictly true that "one hour before midnight is worth two after." Another is that the sleep shall be undisturbed, implying quiet, darkness, and an empty stomach, or the "periodical suspension of all of the functions of external relation." It is a state of rest, rest of the body as a whole, the stomach included, and of the body, a dreamless sleep. The half sleep or dozing in the morning or that disturbed by harassing dreams, either from gluttony or undue excitement, not only can not refresh one really, but must prove more or less depressing. To secure real sleep it is well to take a very light and plain supper, such as will digest before the hour of retiring.

Dr. Hall says that a single slice of bread and butter and a cup of weak black tea are enough for an ordinary person. I should recommend, instead of even weak tea, none, a cup of cocoa, or still better the cocoa shells, a good nervine, are preferable. If the tea aids one in keeping awake while watching, it is evident that it does so by irritation, and that if we would secure the best sleep it may safely be omitted, at least at night. Instead of the bread, a light oat-meal mush, or that made of "granulated coarse wheat," resembling the crushed wheat," would be an improvement, while all pastry difficult of digestion should be discarded, by those at least needing much sleep.—*Dr. Hannaford, in Golden Rule.*

Austrian Mud Baths.—This is the *modus operandi* of a mud bath in Austria, according to the correspondent of a contemporary medical journal. We are going to see the baths in a few days, and will observe whether the description is correct: "Here in Austria they excavate a marsh where decaying vegetable mold and water is in abundance, cart it to the bath-houses, grind it in a mill, and pass it into a large tank, where it is mixed with water and heated by steam. From the tank it is drawn off into portable bath-tubs, where it is again mixed, more water added, and the temperature brought to the desired grade. Then it is wheeled into the bath-room, and the unfortunate bather plunges into a black, bad-smelling mixture, where he remains from twenty minutes to half an hour, when he steps into a second tub, full of pure water, to cleanse himself. The mud is too precious to be wasted, so, after being used, it is deposited in a great heap, where it is said to remain ten years before it will be fit for use a second time. These heaps remind us in more ways than one of those which the dairy farmer accumulates behind his cow stable. The mud bath is popularly believed to be very beneficial in all cases—a veritable cure-all. The physcians questioned on the subject were unwilling to commit themselves as to its indications and effects, except in the case of hypochondriacs, with one exception, and he said where a poultice for the whole body was necessary he knew of no more convenient method of applying it."

Sewer Gas and Typhoid Fever.—Dr. Geo. Hamilton, in the *Medical Record*, takes issue with those who assume the conveyance of germs of typhoid and scarlet fevers, diphtheria and dysentery by contaminated drinking water, and who do not believe that sewer gas can spread the infection or originate the diseases. Referring to the epidemics that sometimes occur suddenly in cities fed with drinking water from some common source, he says that their sudden appearance and as sudden disappearance can not be attributed to the character of the water, except on the supposition that the water changes suddenly from purity to impurity, and *vice versa*, a supposition incompatible with the delivery supply of water from reservoirs. Walled-up cesspools, he says, are common in the city, and not usually found in the country, and the exhalations from unventilated and uncared-for vaults have much to do with the prevalence of typhoid diseases.

Transfusion of Blood.—The *Presse*, of Vienna, lately described an operation of the above kind successfully carried out by Professor Nothnagel in conjunction with Herr Ritter von Hacker. On account of the unsatisfactory results recently obtained in several cases by using human and lamb's blood, it was resolved to try a better method, already suggested by several physiologists. This consisted of a solution of common salt of .6 per cent. rendered alkaline by two drops of concentrated solution of soda. The patient treated on this occasion was a young man who was in imminent danger from weakness of the heart, consequent upon loss of blood by reason of an abscess in the stomach. An incision was made in a vein in the upper part of the arm, and by means of a funnel-shaped receptable about two pints and three-quarters of the fluid in question were introduced into the system of the patient, who is now expected to recover.

Hot Water and Beef.—A writer in the New York *Tribune* sounds the praises of hot water and chopped beef as a wholesome diet. The chopped beefsteaks are made from the most tender and juicy part of the round, chopped in such a manner as to separate the nutritious part from the tough cellular or fibrous structure that contains it, and which forms more than one-third of the substance. This pulp is carefully removed with a spoon and lightly formed into a cake of the thickness of an ordinary beefsteak, broiled and seasoned with salt, pepper and other condiments. This is pronounced perfectly digestible, and far more delicious than a fillet steak. Two glasses of hot water taken an hour and a half before eating, and a diet of this beef, will, it is said, give the most incorrigible dyspeptic new views of life.

Effect of Brain Work on the Teeth.—The French medical journals have recently been discussing the relation of the teeth to the brain, and their conclusions are of considerrble importance to all brain workers. It seems to have been clearly established that excessive and prolonged mental labor causes the teeth to decay by consuming the phosphates which would otherwise nourish the dental structures.

MINING AND SCIENTIFIC PRESS

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Saturday Morning, Oct. 13, 1883.

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Passing Events.

A week of fine sunny weather marks our October days, and causes us all to delight in our California climate. An earthquake has greeted us, too, which is not unexpected in October. All fear of yellow fever contagion is over, the offending steamship having been fumigated and everything done to the satisfaction of the health officers.

News from the north tells of the discovery of a very large river emptying into the Pacific, and second only to the Yukon. Down this latter, by the way, Lieut. Schwatka has come on a raft 1,800 miles. Lieut. Ray's expedition from the Arctic has returned here all well. The miners from up the Yukon report poor luck when the character of the country is considered.

Prospectors are beginning to come in from the mountains and take up quarters in the town for the winter. The debris suit is still going on in this city. There is little of note from the various mining districts.

THE NEVADA BORAX FIELDS.—The Walker Lake *Bulletin* says: The largest supply of borax in the world is in this county, partly on the line of the Carson and Colorado railroad, and partly in Fish Lake valley and Columbus basin. From some of the marshes the cotton-balls are shipped to Europe to be worked. At most, however, the borax is manufactured on the ground. There are three large works near Columbus, which, when in operation, can turn out about six tons daily. In addition to these there are five smaller establishments that together can make two tons daily. The large mills are closed at present, as they have a great quantity on hand, but the small places are steadily at work. From Rhodes' marsh the raw material is nearly all shipped to Liverpool, and Gray & Turner, near Columbus, are making preparations to ship to the same place. They sent samples off last Saturday.

Mineral or Non-Mineral Lands.

A few years ago the Overman and Caledonia mining companies, on the Comstock lode, desiring to sink a deep shaft at a point about 4,000 feet to the east of their claim, so as to reach the lode on its dip at the requisite depth, attempted to obtain possession of three certain tracts of land. Two of these tracts were in conflict with the Yankee claim, in Gold Hill district, located April 21, 1876. This Yankee claim applied for a patent December 10, 1878, and two adverse claims were filed by the Overman and Caledonia companies respectively, during the period of publication.

The two companies, in order to get possession of the land, filed a petition in the District Court to have it condemned, alleging the non-mineral character of the land. The Yankee people alleged its mineral character. At the trial, after an abundance of testimony, the court decided that the land was non-mineral; and upon further finding the necessity for the use of the land by the two mining companies, judgment was rendered in favor of the condemnation. The case was appealed to the Supreme Court of Nevada, but the judgment of the lower court was affirmed.

A feature of the case was, that in the suit brought upon the filing of the adverse claim, the complaint set forth the idea that the determination in respect to the mineral character of the land was binding on the defendant. In their answer, the defendants averred its mineral character, and offered to prove it. But the court held, the determination of that question in the condemnation suit was conclusive between the parties, and excluded the testimony.

The Commissioner of the General Land Office, when the matter came before him, said the Yankee claimants had had no opportunity, except in the condemnation proceedings, to show that the land in controversy was subject to exploration and purchase, and that he "must hold that the law has cast upon the executive department the duty of disposing of the public land, and, as a necessary incident, the authority of determining whether certain tracts are subject to sale under certain laws." He therefore ordered a hearing to determine the following points, viz.: 1. Whether the land is valuable for mineral deposits. 2. If so, whether the Yankee location is a legal one.

A hearing was held and testimony taken; and all the testimony in the condemnation trial was also submitted, as well as that in the adverse claim trial. The Land Commissioner decided the matter by dismissing the application of the Yankee Company, and they appealed to the Secretary of the Interior. He has just given his decision.

The only thing the Secretary of the Interior had to consider was, whether the Yankee claim contained a vein or lode bearing minerals. He concluded that the testimony bearing on this question in the cases had been carefully considered. During the hearing ordered by the Commissioner, the judge who presided at the condemnation suit trial was called as a witness, and testified that he had had large experience in trying mining cases in the district; that he went upon the ground and into the shaft, and made a personal examination of the claim in respect to the mineral-bearing qualities, before rendering his decision. The decisions of the District Court and of the Supreme Court and of the Register and Receiver of the district, all agreed that the Yankee claim contained no valuable mineral or lode. The Commissioner of the General Land Office so decided; and the Secretary of the Interior finally has arrived at the same conclusion.

Perhaps, however, the most practical proof of this fact is, that since the Overman Company entered on the land in 1878 a deep shaft was sunk on the ground in controversy at an expense of some half million of dollars, and no mineral-bearing rock has been found. The Secretary of the Interior incidentally mentions this apparently unimportant fact in his decision, and, perhaps facetiously, adds: "Taking into consideration all the testimony in the case, and giving it due weight, it clearly establishes the conclusion before stated. The decision dismissing the application for patent is therefore affirmed."

It will be seen from this that the law's delays sometimes are advantageous in proving that the law is right. A mass of testimony, costing much money, was taken by the law to prove a certain point, and five or six years' time was used up. Meantime the miners were at work finding out the same thing. It was too bad the Secretary could not have decided the question without that shaft having to be sunk to prove there was no mineral there. It would have been a great saving. As it happened, however, the sinking of the shaft proved the department's theory was right; so there is some comfort in that. It is not often that the officer to judge of a point can have the matter practically decided for him before he commits himself on the subject.

New Dry Gold Separator.

There are several forms of dry gold separators, as they are called, which operate by blowers or fans, or the action of percussive blasts of air. A form of these useful machines has just been patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, by S. C. Chaney, of Chico, Butte Co., which is essentially different in operation from any heretofore designed.

Through suitable pulleys, belts and a power device, motion is transmitted to revolve certain conveyers, and a fan blower. The conveyers are hollow cones, the open ends of which open into a smoke-stack. A fire is started on the grate bars under the conveyers. The suction of a fan causes a draft through the grate bars, and also through both conveyers. The draft carries the flame with it through both conveyers. The auriferous earth, sand or quartz is fed into a hopper, and goes through the upper conveyer. It passes down the inclosed portion of the upper conveyer and drops through a passage, where the large rocks are caught on bars, and then into the lower conveyer, which inclines the other way and carries it back again. Here it drops into still a third conveyer, which discharges it, the larger portions falling out at the end, while the smaller pass through perforations and are caught separately.

In its course through these conveyers the material is gradually concentrated by increase of the opposing draft, which carries off the very light dust through the stack. The fire dries it thoroughly, causing a good separation and permitting it to crumble. It is only the heavy concentrative material which finally passes through into the last conveyer. This last one is not subjected to the fire, and in it the concentrations are cooled.

Within the two upper conveyers are provided arms carrying heavy weights or hammers, which in the revolution of the conveyers fall down upon and crumble the material. Means are provided for cutting off the flame from the conveyers when necessary. It will be seen that the combination of heat with the draft is the essential feature of this machine. The method of crumbling is also peculiar.

Regulations Under the Mining Laws.

On October 31st, 1881, the General Land Office issued a circular to Registers and Receivers, entitled, "United States Mining Laws and Regulations Thereunder." These we published in full at the time, as they are of great interest to the mining community. Additional regulations have been promulgated amendatory to to that circular, which, except as modified by these, remain in full force. The following are the new regulations:

1. No application will be received, or entry allowed, which embraces more than one lode location.

2. A party who is not an applicant for patent under section 2325, revised statutes, or the assignee of such applicant, is not entitled to make entry under said section, and in no case will the name of such party be inserted in the certificate of entry. This regulation has no reference to proceedings under section 2326.

3. Any party applying to make entry as *trustee*, must disclose fully the nature of the trust and the name of the *cestui que trust;* and such trustee, as well as the beneficiaries, must furnish satisfactory proof of citizenship; and the names of beneficiaries, as well as that of the trustee, must be inserted in the final certificate of entry.

4. Where an adverse claim has been filed and suit thereon commenced within the statutory period, and final judgment determining the right of possession rendered in favor of the applicant, it will not be sufficient for him to file with the Register a certificate of the clerk of the court setting forth the facts as to such judgment, but he must, before he is allowed to make entry, file a certified copy of the judgment, together with the other evidence required by section 2326, revised statutes.

5. Where such suit has been dismissed, a certificate of the clerk of the court to that effect, or a certified copy of the order of dismissal, will be sufficient.

6. In no case will the relinquishment of the ground in controversy, or other proof filed with the Register or Receiver, be accepted in lieu of the evidence required in paragraphs 4 and 5.

7. Where an adverse claim has been filed, but no suit commenced against the applicant for patent within the statutory period, a certificate to that effect by the clerk of the state court having jurisdiction in the case, and also by the clerk of the circuit court of the United States for the district in which the claim is situated, will be required.

8. Possessory title to a lode claim held and worked for a period equal to the time prescribed by the statute of limitations for mining claims of the state or territory where the same may be situated, may, in the absence of any adverse claim, be established in the same manner as now allowed in placer claims, and indicated generally in paragraphs 67, 68 and 69 of the circular hereby amended.

9. No entry will be allowed until the Register has satisfied himself, by a careful examination, that the proper proofs have been filed upon all the points indicated in official regulations in force, and that they show a sufficient bona fide compliance with the laws and such regulations. A strict observance of this regulation will be required.

Alum, Tellurium and Ozocerite.

On this coast there are many minerals which we do not consider of economic value—not because they could not be sold if mined, but because the conditions are not right to work them. They may occur associated with other minerals, or in such a shape that we have not had the requisite experience to make them pay. Among these is

Tellurium.

Though not very abundant, tellurium can hardly be called a rare metal in the Pacific division of the United States, having been found at several localities in California and reported elsewhere in this region. The principal deposits of this metal, so far as discovery has gone, are at the Meloues mine on Carson Hill, in Calaveras, and at the Raw Hide and Golden Rule mines in Tuolumne County, California, where it is found in combination with gold, silver, sulphur, etc., many large and exceedingly rich samples of the telluride of gold having been taken out of these mines. Tellurium has also been found under like conditions in Utah, but the extent and value of the deposits there remain undetermined.

Alum.

This mineral exists in the form of an efflorescence on argillaceous rocks in the Silver Mountain District, Alpine County, California. But the deposits here are too light to be of much practical value. In the early part of 1875, the discovery of what was termed an alum lode was reported to have been made on Howell Mountain, Napa County, California. As is often the case with these reputed finds, much was claimed for the extent and purity of this deposit; but as very little alum from that locality ever found its way to market, these first accounts of this discovery were presumably much exaggerated. Some of the springs of the Geyser group, Sonoma County, also small springs near Owen's Lake, carry a small percentage of this mineral. Certain clays found in Santa Clara and Calaveras Counties, show a strong taste of alum; but if any valuable deposits of this mineral have ever been found in the Pacific Coast, the fact has not become generally known.

Ozocerite.

Ozocerite was discovered in Southern Utah during the summer of 1877. This find was considered so valuable that a company having their headquarters in Boston was formed the next year for working the deposit, which has since been worked quite extensively and with some profit. The crude material is said to be of good quality; samples sent to England to be tested having been pronounced equal to the best Turkish article. Other samples analyzed in San Francisco were found to contain a large percentage of white wax, of the kind used in making paraffine candles. This substance can be mined and delivered in Boston at a cost of four cents per pound.

NOTE.—India rubber erasers are often hard, and in this condition, instead of erasing a pencil mark in a cleanly manner, convert it into a smudge. To render such an eraser useful, soak it for a few days in ammonia. C. H. A.

MINING STATISTICS.—By laborious statistics running through thirty years in the United States, from 1850 to 1880, from a large list of mines reported, it is shown that while $700,000,000 have been expended on mines of gold, silver and lead, these mines have returned $2,200,000,000, being 300 per cent profit in cash.

THE Director of the Mint authorizes the purchase of 410,000 ounces of fine silver for use at the Philadelphia, New Orleans and San Francisco Mints.

The Bassick Ore Deposit.

(CONTINUED FROM PAGE 230.)

shells surrounding them are so tangent. Where we should reasonably expect to find actual contact between the bowlders themselves, we frequently find instead at the point of approximate contact two separate shells of ore between them, one belonging to each nucleus, thus showing that, although the similar coatings upon the different nuclei must have been deposited at the same time, the fragments could not at that time have been in contact. What supported them during the period when the coating was taking place seems to be as much of a mystery as was to the ancients the base on which Atlas stood."

And such a mystery it would remain if we supposed, as Mr. Grabill evidently does, that the *inner* shell was the first deposited, and that those following successively toward the exterior were deposited successively, the outer coat being the last of all. As a fact, just the reverse took place. The *outer* coat was formed first, and the inner coats successively followed toward the center, space for each succeeding coat being obtained by the gradual solution of the trachyte. The alkaline solutions bringing the metallic sulphides for silica simply exchanged the metallic sulphides for silica and silicates of the alkalies and alkaline earths contained in the trachyte, mol ecule for molecule, and thus a veritable "pseudomorph" of ore after trachyte bowlder was produced. This process might go on until the entire nucleous was dissolved and replaced by ore, and such "bowlders" of ore have actually been found in the mine.

There is nothing unusual about this formation of concentric layers of mineral matter by successive depositions toward the center. Precisely the same thing is seen in the formation of amygdules in the cavities of igneous rocks. Chalcedony amygdules usually consist of many concentric layers, not infrequently lined in the center by quartz crystals with their crystalline facets projecting inward. Sometimes we can discover a definite channel through which the solutions make their way inward. At other times, none such exists, and we must suppose a process of gradual exusion of succeeding coats through those already formed. Either, or both of these processes has been operative in the case of the Bassick bowlders, and thus the whole mass has been solidly supported throughout the entire period of formation.

Barren Bowlder Zone.

The last feature, to which I shall especially advert is the existence of the barren zone of bowlders upon both sides of the ore mass, and between the ore mass and the solid trachyte, to the north and south of the deposit. Why is the ore found near the center of the bowlder zone, and not immediately adjacent to the solid rock? Mineral solutions circulating through the rocks always follow channels of least resistance. Given such a case as we have before us, where an igneous rock has broken through superincumbent rocks, crushing and fracturing them along the line of disturbance, such a channel of least resistance will be formed near the center of the crushed zone and not near either of the solid rock masses, for the fragments of the older rock near the contact with the younger eruptive, will be cemented together by the solidified rock magma of this later rock which will permeate, while in a fluid state, a certain distance among the fragments; while on the opposite side of the zone of disturbance the rock will gradually become more compact, owing to the increasing distance from the seat of mechanical disturbance. If the supply of metallic solutions were unlimited, the whole brecciated zone would become filled with the metallic deposit. If limited, as in the present case, the heaviest deposition of ore would take place along the center of the channel pursued by the solutions in their upward course, and from this center outwards in both directions, the thickness and number of coats would gradually diminish and finally disappear altogether.

I have given now my explanation of each of the peculiar features of this very interesting ore deposit. The other problems connected with it are such as are common to all deposits of metallic sulphides, and will not be considered in this connection.

General Statement of Theory.

I will recapitulate in a few words and in their natural sequence, the various processes resulting in the formation of the Bassick ore deposit. First, and as an isolated instance of what took place at about the same time, all over the Cordillera system, occurred the eruption of the porphyritic trachyte, and the compact trachyte, probably in many successive outpours from one or more local sources, building up a mass of eruptive material, over 1,000 feet thick and resting immediately on the Wet Mountain granite. The first and perhaps subsequent eruptions were poured over surfaces more or less covered with vegetation. The woody material thus enveloped became converted into charcoal through the high heat of the lava, and exclusion from air by being enveloped in the liquid material.

Subsequently a third variety of trachyte was forced up through the others in a liquid condition, fracturing them in the neighborhood of its upward course, penetrating some distance in among the fragments and cementing them together into an igneous breccia. Fragments of underlying varieties containing possibly charcoal were thus brought towards the surface. Following this eruption, came alkaline solutions containing metallic sulphides which found their way to the surface through the brecciated zone produced by the last eruption. These alkaline solutions at once attacked the angular fragments between which they circulated, rounded off their sharp angles and edges, deposited in the spaces between the bowlders thus formed, and concentrically around each bowlder, one or more shells of ore, depending upon the supply of mineral solution immediately at hand. When more than one ore shell was deposited about the same nucleous, the outer shell was formed first, the others following in order towards the center. In some cases the entire nucleous was dissolved out and replaced by ore.

Any fragment of charcoal inclosed in the trachyte bowlder was left untouched by the alkaline solutions, which, however, dissolved away the surrounding trachytic material, replacing it with ore, leaving thus the charcoal completely imbedded in ore. The silica dissolved out of the trachyte was, in part at least, deposited as a siliceous gangue between the bowlders, sometimes also within the pores of the charcoal forming silicified charcoal.

The kaolin left as a residue after the total destruction of the trachyte was deposited between the bowlders.

All of the trachyte for some distance either side of the deposit was strongly decomposed by the combined action of solutions from below, and of superficial circulating waters, determining thus the various shades of gray, pink, and white which have misled most observes into the belief that many kinds of rock were present among the bowlders.

A practical consideration of the highest importance is the extent, the continuity of the ore body. This depends upon the form and extent of the youngest trachyte. If this is a dyke eruption, the ore is liable to be continuous horizontally, or, discontinuous bodies of ore similar to the Bassick are liable to occur in a horizontal direction so long as the youngest trachyte holds out horizontally. If this trachyte is not a dyke eruption, but has come up through a more or less cylindrical opening, like the throat of a volcano, then the deposit will be of a restricted horizontal extent. In either case it will extend indefinitely downward, behaving in this respect like an ordinary fissure vein, of which class of deposits it is indeed but a variety modified in character by the local conditions attending its formation.

It is with considerable hesitation that I have prepared this paper concerning a geological problem which I have never been able to study on the spot. The opinion of observers who have had the opportunity to examine the local conditions, have seemed to me so fundamentally erroneous (if we except Mr. Rafter's), and have surrounded the deposit with such an atmosphere of mystery that even the general considerations which I could advance, so far at least as they were based upon a careful study of specimens, appeared to be not without some value.

A. WENDELL JACKSON.
Museum of Economic Geology, University of California, Berkeley.

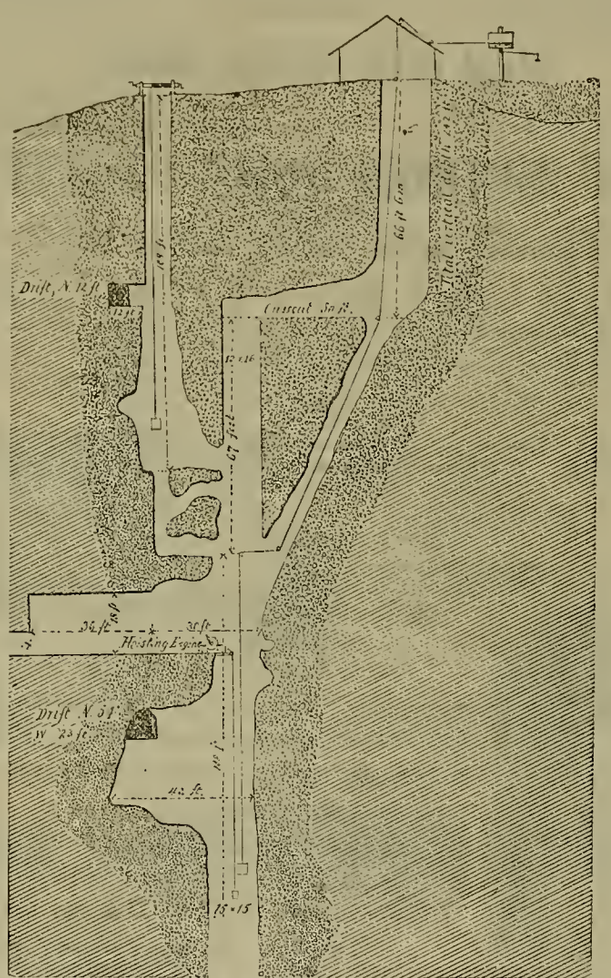


Fig. 4.—CROSS SECTION OF THE BASSICK MINE.

Blasting in Mines—No. 11.

Classification of Rocks.

Of course very few miners can classify rocks geologically, or tell the mineral constituents. Still some slight knowledge of this kind ought to be acquired, as it will enable him to apply his skill and strength to the best advantage. Some knowledge is acquired in daily practice, and careful observation will greatly increase this. He should observe the character of the rock he is working on, and the kind of tools employed for special work. Great variation exists in the hardness and coherence of rocks. A rock that is abundantly jointed may be excavated with much greater facility than one in which the joints are sparsely developed.

It is also evident that a stratified rock will yield more readily than one of the igneous class where there is no lamination. The classification of rocks, therefore, according to their power of resistance to excavation and the adaptation of tools and other means to the requirements of each class, constitute a matter of great importance in mining. The use of unsuitable means, or suitable means improperly employed, occasions waste. Ignorance in respect to the classification of rock often results in accidents also, and loss of life. Andre, in his "Coal Mining," says on this subject:

For the purposes of excavation, rocks may be classified into (1) loose rock; (2) soft rock; (3) tender rock; (4) compact rock; and (5) hard rock. The first of these classes, or loose rock, includes uncompacted sand, vegetable earth, and disintegrated rock of any kind that has little or no coherence among its particles. Soft rock comprises plastic clay, loam and marl. Tender rock includes all rocks of an indurated character that have but little coherence between their laminæ, as shale, or that are much broken up by joints. Compact rock includes rocks of a moderately fine texture that have been firmly compacted and cemented, as sandstones, and some limestones. And hard rock comprises the igneous rocks, the hardest limestones, and the conglomerates.

Loose and soft rocks may be easily cut by the shovel and spade, and these tools will, therefore, be chiefly employed in excavating them. The pick will be required as an auxiliary instrument to loosen the rock in some cases. In excavating tender rock, the pick will constitute the chief tool, the shovel being used merely to clear away the dislodged rock. In applying this tool, it must be borne in mind that rocks of a shaly structure cleave readily along the planes of lamination, but are often very resisting in the direction of right angles to these planes. When the rock is jointed, there will always be one direction in which any given block will yield more readily than in another. By taking account of the planes of lamination, cleavage, and jointing, means will be perceived by which the block may be dislodged with the least expenditure of force. Also the most suitable form and angle of cutting-edge and degree of temper may be determined by a consideration of the mineral composition and structure of the rock. These and other circumstances peculiar to the case to be dealt with will afford abundant opportunity for the exercise of the judgment. When tender rock of a jointed character occurs in the roof of underground workings, it is of the highest importance to note its features attentively.

Hardness and strength are qualities by no means identical. A rock-bed composed of silicious materials strongly cemented together may be so fissured by jointing as to fall readily when undermined. To ascertain the strength of a rock roof, the miner strikes it with some sharp instrument, as a hammer, sledge, or pick. A dull sound indicates the existence of joints, and a sharp sound, free from ring or echo, continuity and strength. In placing the prop timber, it is obviously necessary to consider the character of the jointing, in order to obtain a maximum degree of security with a minimum expenditure of material. The excavation of compact rock is effected by means of the pick, the wedge and explosive compounds. In proportion as compact rock approaches in character tender rock on the one hand, and hard rock on the other, the use of the manual tools or of the explosives will predominate. It must be remarked, however, that the use of explosives is rapidly extending even to rocks of the tender class. The dislodgement of hard rock can be effected only by means of explosives. The pick and the wedge are required as auxilliary tools to complete the dislodgement of blocks which have been only partially effected by the action of the explosive. The effective placing of the blasting holes requires a full appreciation of the character of the rock relatively to its mineral composition, its structure, texture and system of jointing. In rock-drilling by machinery, the structure and texture are particularly important, for while the mineral composition of the rock will determine the proper temper of the drill and the angles of its cutting edges, the structure and texture will determine its most suitable form. A celular or "vughy" rock, for example, may be best penetrated by a form of drill which would prove less effective in a rock of compact texture.

THE CANNON-BALL QUARTZ CRUSHER.—The Grass Valley *Union* says: Another trial of the Dyer Cannon-Ball Quartz Crusher was made yesterday at Brunsteter's planing establishment, in the presence of a number of spectators. The quartz provided for the trial was hard clear quartz without any admixture of earth. A number of tests were made, one of which gave a crushing of 600 pounds in one hour and twenty minutes; and one of 100 pounds in ten minutes; one of 100 in seven and a half minutes, the machine being driven at different rates of speed. The quartz passed through a No. 5 screen, and was discharged as a fine pulp, ready for any amalgamating process. The machine is rated as capable of crushing six tons of quartz in 24 hours. The tests made yesterday and on previous occasions show that it will do more. As a prospector and for ordinary mining operations it seems just the machine that is needed, and such was the opinion of those who saw it at work yesterday.

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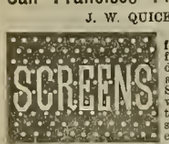
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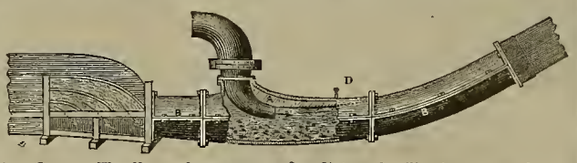
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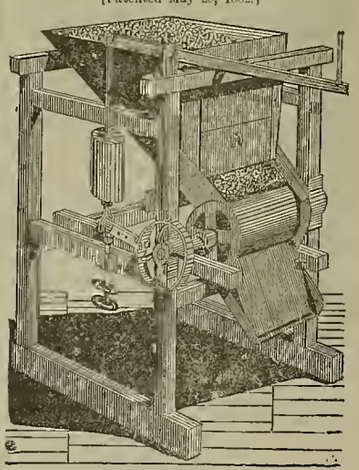
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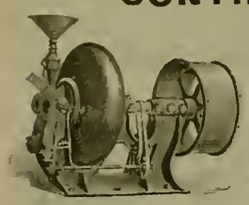
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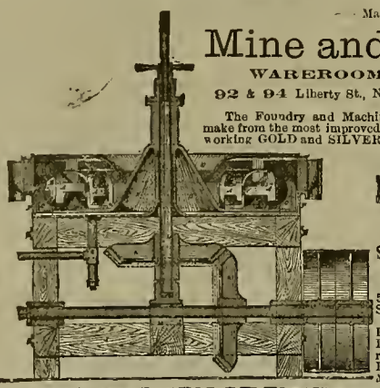
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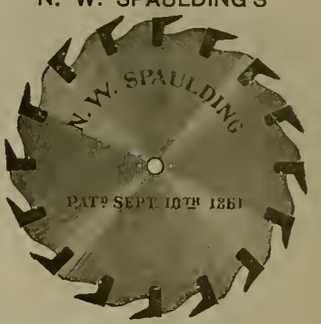
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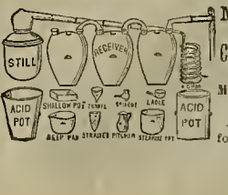
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The California Brass Works, one of our old-established local manufactories, has a display which shows that their work is confined to no special class of goods. Messrs. Weed & Kingwell, the proprietors, have been in business here a long time, and have built up a steady trade. Among the articles exhibited are several forms of hinges, bells, gongs, steam-whistles, basin bibbs, cocks, railing, valves, lubricators, nozzles, row-locks, boat-hooks, gauges, couplings, block-sheaves, latches, safety-valves, brass nails, spikes, etc. These articles are exhibited just as they are made and ready for sale, no fancy finish having been added.

Organ Manufacture.

In the art gallery there is on exhibition a large Bergstrom organ, made for the Episcopal church at Los Angeles. It is a handsomely finished instrument, and well made in all its parts. The factory of Bergstrom & Co. is one of our well established and growing home industries. Mr. John Bergstrom began the business here in 1864 on a very small scale, but it has grown so there is a large factory, well equipped for making small or the larger size organs. The largest organ on the coast, that in the Metropolitan Temple, was built by this firm. They make the whole organ here except the reeds, and all the details of the mechanism are carefully carried out. California woods are used wherever practicable. Organs made by this firm are in use all over the coast, not only in California, but in Oregon, Washington Territory, Nevada and Arizona. Some have even been sent to Central America.

The San Francisco Tool Company.

The exhibit made by this company is one of the most creditable in the fair, not only from the character of the articles, but from the excellent workmanship and originality of the designs. From a small beginning the works have been much enlarged, and the scope of their manufacture greatly increased. As an entirely new industry on this coast, its growth and prosperity is very satisfactory. They exhibit a 24-inch and 16-inch engine lathe, standard, and a 24-inch hollow spindle lathe. There is also one of the new drilling machines with an improved motion. It is a curious machine. The spindle is moved rapidly for a range of twenty-four inches up and down, and when stopped at any point within that stroke is ready to operate instantly.

The feeding mechanism is similar to that employed on the engine lathes made by these works, operating by friction, and yielding when the pressure is too great. The table for supporting the work, contrary to the usual practice, is made rectangular, with a solid angle plate attachment at one side, which does not prevent the lathe from being turned around the same as a circular one.

The dimension sawing machine for making patterns is the first ever shown here. It is the finest specimen of mechanical work in the fair. It is not a sawing machine, in the ordinary sense of preparing lumber ready for planing, but is so made, and the saws are so arranged, that all kinds of pieces are cut to absolute dimensions ready for varnishing for use, requiring no planing afterwards. Thirty of the large engineering establishments in Europe use these machines, which will hereafter be made here.

They also exhibit 2, 4, 6, 8 and 10 inch turbine pumps. The ten-inch one is a departure from all the methods of construction followed heretofore, either by these works or others. It is a double pump in every way. There are double inlets, double pulleys, four bearings on the shaft, and the casing is parted horizontally. The pump weighs about 1,200 pounds. There is also one of their well known planers of large size. There is a new shaping machine designed within the past year, such as we illustrated not long since.

Another object of interest is the experimental blower made preliminary to going into the manufacture of this class of goods. It is made analogous to the turbine pumps, and one of them has lifted eleven inches of water. The casing is solid in one piece. The runner is of wrought iron and steel plate, there being no castings about the runner. A remarkable feature is the small size of the blower in proportion to its capacity. The runner is nearly as large as the casing. This is rendered possible by the discharge being tangentially and over the side of the runner and into the casing. There is also exhibited a hydraulic mandrel-driving machine, made on the plan of Messrs. Smith & Carpenter, of Manchester. The San Francisco Tool Company are going to make these machines here. A very fine piece of workmanship, indeed, is the head of the new planing machine now being constructed. It will be thirty-three feet long, and will plane twenty-nine feet long and thirty-six inches wide. This piece of work has attracted great attention from skillful mechanics. They also show some of their gauging implements, measuring machine, etc. They have also a hydraulic jack made wholly of steel, weighing about half what these things usually do. It is a four-ton jack.

Almalgamating Plates.

On the side wall near the right-hand entrance to the machinery department is a large silver-plated sheet of metal, which to the ordinary observer would hardly appear so important a thing as it is. This is a silver-plated amalgamating plate, one of the appliances which has done much towards a more perfect system of saving gold on this Coast since its first introduction by Mr. Denniston, of the San Francisco plating works. It is used for quartz, gravel and placer mining, and for saving fine gold is unsurpassable. In fact the old-fashioned bare copper-plate has been entirely superseded in all good quartz mills, these plates taking their place. The San Francisco plating works are fitted up to make very large plates of this kind, making a specialty of the business. They not only supply this state, but Oregon, Idaho, Montana, Utah, Colorado, Arizona and New Mexico. The plating is quite heavy, and will not scale or break off. These works have lately been enlarged, and their facilities increased to keep pace with the business. Gold, silver, nickel and copper plating on all metals is done. Mr. Denniston is the pioneer in this business on the Coast.

Pacific Saw Manufacturing Company.

This old established and successful representative of progressive home industries always has one of the best arranged exhibits in the annual fairs in this city. Not only is the display arranged with taste and judgment, but the variety and style of the products also calls for commendation. The invention of Spaulding's improved insertible saw teeth a long time ago had the effect of making this company known all over the United States, and the manufacture of these saws and teeth is still a specialty with the company. They make their saws of metal of superior character, and keep track of every improvement in their line. They make not only saws of every conceivable kind, but saw mandrels, springs, planers and curriers knives, gummers, etc. About fifty men are employed here in the various branches of manufacture. Circular saws up to 75 inches in diameter are made. The company is also agent for C. B. Paul's files, a widely known brand of this useful implement.

The Judson Manufacturing Company.

This company is one of recent growth, but its development has been so rapid that it has taken its stand as one of the representative home industries The character of the products are such as to bring them into very general use. The company control the Clipper Gap Iron Mines, Placer County, this state, the largest iron mine on this coast. The establishment near Oakland, is one of the largest in California. There are numerous buildings, blacksmith shops, a rolling mill, etc. The equipment of the establishment is very complete in all respects. One of the most interesting features of this factory is the manufacture of tacks. At the exhibit in the fair is a case with 350 kinds and sizes of tacks, clout, trunk and finishing nails. The Judson file works is represented by a fanciful arrangement of files on the side wall of the display. This is a new industry on this coast. Various styles of files are made. The California Victor Mower is one of the principal articles of manufacture. This machine has been very successfully introduced by the company, and is specially adapted for heavy crops and hard work. Among the varieties of hardware made by the company, are barn-door hangers, rail and pulleys, well wheels, cast washers, sledges, hitching weights and posts, etc. The Judson horseshoe nails form another very important branch of local manufacture. The California Iron and Steel Co., at Hotaling, have in this display samples of iron ore, pig iron, etc. The products bring high prices in our market, and are well known.

Medals and Diplomas.

A partial list of the award of medals and diplomas sent in by the committees is a follows:

Gold medals, class 21—Larkins & Co., best general display of carriages; Waterhouse & Lester, best display of articles used in the manufacture of carriages and best display of bicycles; David Kerr, best two or four-horse truck.

In class 22, the California Furniture Manufacturing Company takes the gold medal for the best general display of furniture; the J. M. Brunswicke & Balke Co. for the best display of billiard tables; the Statham Piano Co. for California-made pianos; John Bergstrom for best pipe organ.

The silver medals have so far been adjudged as follows: Robert Reed, for artificial limbs; P. F. Butler, for milliuery; Adolph Ghoring, for artificial flowers; Mark Sheldon, for sewing machines; Mrs. Ober, for corsets; Kohler & Chase, for brass wind instruments; Zeno & Mauvais, for musical instruments; Charles Morrell, for California-made banjos; Studebacker & Brothers, for carriages other than California manufacture; Larkins & Co., for best hack, best coupe and best top buggy of California make, separate awards; David Kerr, for best single or one-horse truck and dump or coal cart; Jerry Lowney & Son, for best platform spring wagon; A. W. Sanborn & Co., for milk wagon; Baker & Hamilton, for four-spring, two-seat wagon; M. J. McCue, open rockaway, also phaetons; Charles Oester, axles; J. A. Bills, two-wheel carts; Studebacker Bros., farm wagons; West Coast Furniture Company, parlor set, bedroom set, sideboard, separate awards; Indianapolis Chair Company, extension bed lounge; Wakefield Rattan Company, rattan furuiture; Hardie & Darling, decorative wall hanging.

The bronze medals are thus far distributed to P. Liesenfeld, billiard-table cushion; J. M. Brunswick & Balke Co., billiard tables for parlor use; California Furniture Co., best dining-room set; also for assortment of chairs; Chadbourne & Co., folding bed; B. F. Farrar, sofa bed; G. W. Clark & Co., window shades and fixtures; also for wall paper; Gilbert & Moore, office desk; A. J. Bailey, ostrich feathers and plumes; W. E. Shaw, open buggy; Geo. Hall & Co., farm wagon; M. J. McCue, carriage and buggy wheels; Henry Hartop, butcher cart; W. E. Shaw, double cart; B. Grave & Co., jump-seat buggies; E. D. Boncelli, musical instrumeuts; Hallet, Davis & Co., imported pianos; B. Galland, portable bath.

The approved diplomas are awarded to: J. M. Brunswick & Balke Co., billiard balls, cues and racks; Gilbert & Moore, office furniture; Pacific Spring Co., slat spring-bed; T. S. Clark & Co., metal spring-bed; C. H. Townsend, kitchen table; S. & G. Gump, pedestals; California Furniture Manufacturing Co., easy chair; Waterhouse & Lester, truck and wagon wheels not on vehicle; Wakefield Rattan Co., child's carriage; Walter Hyde, hobby horse; B. Grave & Co., specimen of carriage blacksmithing; M. J. McCue, buggy wood-work; San Jose Agricultural Works, fruit wagon; Henderson & Thompson, parallel spring for buggy; J. W. Coppage, machine-made buttonholes, Studabecker & London, tailor's square; G. H. Stebbins, steam bath; Wm. Beeman, trousers and braces.

THE very best iron preparation, and the one having the largest sale, is Brown's Iron Bitters.

THE Dominion government is making an effort to minimize, so far as possible, Sunday labor in connection with the postal service.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

M. P. OWEN—Santa Cruz county.
J. W. A. WRIGHT—Merced and Tulare counties.
JARED C. HOAG—California.
B. W. CROWELL—Colorado, Utah and Montana.
M. H. JOSEPH—Eureka, Nev.
I. M. LEIBY—San Bernardino and San Diego counties.
J. J. BARTELL—Santa Clara county.
H. W. FOLSOM—Los Angeles county.
C. E. CURTIS—Kern and Inyo counties.
A. S. DENNIS—San Mateo county.
GEO. FRANCOEUR—Shasta county.
J. W. BOYER—Contra Costa county,

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time they intend to pay for it*, let them not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent.

INFORMATION WANTED.—Information is wanted of Wm. Erskine, who has been living near Hailey, Alturas county, Idaho Territory, for two years past. His wife has not heard from him since last Spring. He was President of the Miners' Union of Silver City, Idaho, five or six years ago. Any news of him would be thankfully received by Mrs. Hannah Erskine, of Nevada City, Cal., or R. H. McDonald, Los Angeles, Cal.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life The number of sea lions is increased, and there is a better chance to study their actions The pavilion has new varieties of performances. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

Mining Companies.

Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

ASSESSMENT NOTICE.

Seaton Gold Mining Company.—Location of principal place of business, San Francisco, California; location of works, Drytown, Amador county, Cal.

NOTICE is hereby given that at a meeting of the Board of Directors, held on the 27th day of September, 1883, an assessment (No 4) of ten cents (10c.) per share was levied upon the capital stock of this corporation, payable immediately in United States gold coin, to the Secretary at the office of the Company, Room 6, No. 528 California Street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 1st day of November, 1883, will be delinquent and advertised for sale, at public auction, and unless payment is made before, will be sold on Monday, the 19th day of November, 1883, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

A. MARTIN, Secretary.

OFFICE—Room 6, No. 528 California Street, San Francisco, California.

Educational.

W. E. CHAMBERLAIN, JR. T. A. ROBINSON.



Life Scholarships, $70.

PAID IN INSTALLMENTS, $75.

SEND FOR CIRCULARS. SEND FOR CIRCULARS.

SPECIAL NOTICE!

In Consequence of the Late Fire, we are Temporarily Located at the SYNAGOGUE Mason Street, between Post and Geary Streets, San Francisco.

TRINITY SCHOOL,

1534 Mission St., San Francisco.



Church, Boarding & Day School for Young Men & Boys

Prepares for College and University. For Information, address REV. E. B SPALDING, Rector.

THE HARMON SEMINARY,

Berkeley, Cal.

A FIRST-CLASS BOARDING SCHOOL FOR YOUNG LADIES.

For Catalogues or other information, address S. S. HARMON, Berkeley, Cal., or E. J. WICKSON, 414 Clay Street San Francisco.

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THE CELEBRATED **A** BRAND.

Shipped Direct from the New Almaden Mine,

NEW ALMADEN, SANTA CLARA COUNTY, CAL.

J. B. RANDOL, 320 Sansome Street, S. F

[P. O. BOX, 1678.]

QUARTZ MILL FOR SALE.

A TEN-STAMP QUARTZ MILL COMPLETE, including Battery Frame, ten 750-lb. stamps, high mortars; one 9-foot Knight Water Wheel; about 1,000 feet iron pipe, 6 to 10 inches; one 14-foot buddle; shafting, belting, copper plates, etc. All in good condition and nearly new. At GRIZZLY FLAT, EL DORADO COUNTY, CAL.

Inquire of L. S. Taylor, Attorney-at-Law, Sacramento or Wales L. Palmer, at Golden State and Miners' Iron Works, 237 First St., San Francisco.

Cheap Ore Pulverizer.

There is for sale in this city, by I. A. Heald, American Machine and Model Works, 111 and 113 First St., a Rutherford Pulverizer, an improved revolving barrel crusher, which was only used a few times and is as good as new It will be sold very much below cost, and miners who are in need of such an appliance for a small mine will do well to make inquiries concerning it. It is suitable for a pulverizing mill for powder or other substances. Reference as to above can be had upon applying to this office.

Dewey & Co. { 252 Market st. } Patent Ag'ts.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING OCTOBER 2, 1883.

285,873.—ELEVATOR AND CARRYING APPARATUS—Ira Bishop, Benicia, Cal.
285,793.—TWO-WHEELED VEHICLE—C. W Burgtorf, Petaluma, Cal.
285,975.—GUARD FOR CARS—John Craig, S. F.
285,879.—ICE MACHINE—Thos. H. Day, S. F.
286,120.—HAND RAKE—W. F. Drew, Sacramento, Cal.
285,881.—POST DRIVER—H. E. Furman, Plymouth, Michigan.
285,895.—GANG PLOW—J. M. Fix, Bird's Landing, Cal.
285,903.—HOISTING APPARATUS FOR WAGON DERRICKS, ETC.—Byron Jackson & G. W. Bonds, S. F.
286,014.—SEWING MACHINE NEEDLE—A. M. Jenkins, Adm'x, S. F.
286,044.—CABLE RAILWAY—McCall & De Vry, S. F.
285,910.—GRAFTING TOOL—K. McLennan, Berkeley, Cal.
285,918.—CLAMP FOR STONE WORK—J. O'Connor, Piedmont, Cal.
286,163.—GRIPPING AND CARRYING APPARATUS FOR CABLE RAILWAYS—Henry Root, S. F.
286,158.—ELECTRIC CUT-OFF—John A. Tupper, Salt Lake City, U. T.
285,942.—ROAD ENGINE—John S. Woolsey, Gilroy, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific Coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

GRAFTING TOOLS.—Kenneth McLennan, Berkeley. No. 285,910. Dated Oct. 2, 1883. This invention relates to certain improvements in that class of grafting tools in which the cutting tools are adapted to be actuated by a hand implement. It consists in a peculiar angular knife fitted into one of the jaws of the implement, in an opposing block in the other jaw, against which said knife is adapted to operate, and in a means for adjusting and limiting the movement of the knife against said block. The object is to prepare the scions and stocks of young trees or vines for grafting by means of a peculiar counter graft on each, whereby the two may be fitted togcther with an advantageous union by close and perfect joint. Union of the stock and scion has been heretofore accomplished by a joint made by tools similar in operation to this, but with knives of such shape as not to be able to make a cut in each providing for so advantageous and perfect connection as this kind of knife permits.

GUARD FOR CARS.—John Craig, S. F. No. 285,975. Dated Oct. 2, 1883. This guard attachment is specially adapted for cable cars, and is intended to prevent accidents by furnishing a means for keeping persons from getting under the wheels. An iron frame with side pieces and cross pieces is secured on the axles. The ends of this frame are inclined downward until they reach within a short distance of the road-bed. The ends are hinged and limited in their downward movement. Under the lower bar, on the guard, are rollers which impinge on the track. The device is steady. Being secured to the frame it travels at a uniform distance from the road-bed, and will neither strike small obstructions nor rise up, thus adapting it for its purpose.

CLAMP FOR STONEWORK.—Jeremiah O'Connor, Piedmont, Alameda County, Cal. No. 285,918. Dated October 2, 1883. This invention relates to a means for clamping stonework together so as to form a solid permanent bond or union between the separate stones forming a structure. It consists of metal bars formed to enter the hole made in the stones to be united, and keys by which they are secured thereiu, and a union or screw coupling by which the two are drawn or held together.

ROAD ENGINE.—John S. Woolsey, Gilroy, Cal. No. 285,942. Dated Oct. 2, 1883. This steam or power road-wagon consists of a pair of friction wheels mounted on a shaft above the bearing wheels of the wagon, driven by the engines, means being provided for throwing them into and out of contact with the bearing wheels, so as to drive or stop the wagon. By applying the power on the rims of the wheels a saving is affected. Springs allow the boxes of the shaft carrying the friction wheels play enough so they will accommodate themselves to any inequalities upon the rims of the wheels, or to any stones or dirt that may adhere to them as they revolve.

ELEVATING AND CARRYING APPARATUS.—Ira Bishop, Benicia, Cal. No. 285,873. Dated Oct. 2, 1883. The improvements consist in a traveling elevator belt, provided with peculiar hooks; in a carrier belt above to receive the load, and in the mechanism for driving the belts and for changing the direction of the carrier belt. The general object of the invention is to elevate material or articles from one point to another, and to transport them to different places; but the particular use to which the apparatus is adapted is to raise material or sacks from the ground or lower floor of a warehouse to the upper floor, and to carry it along on said floors to points desired.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $4 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turning a leaf.

The Secret

of the universal success of Brown's Iron Bitters is simply this: It is the best Iron preparation ever made; is compounded on thoroughly scientific, chemical and medicinal principles, and does just what is claimed for it—no more and no less.

By thorough and rapid assimilation with the blood, it reaches every part of the system, healing, purifying and strengthening. Commencing at the foundation it builds up and restores lost health—in no other way can lasting benefit be obtained.

75 Dearborn Ave., Chicago, Nov. 7.
I have been a great sufferer from a very weak stomach, heartburn, and dyspepsia in its worst form. Nearly everything I ate gave me distress, and I could eat but little. I have tried everything recommended, have taken the prescriptions of a dozen physicians, but got no relief until I took Brown's Iron Bitters. I feel none of the old troubles, and am a new man. I am getting much stronger, and feel first-rate. I am a railroad engineer, and now make my trips regularly. I can not say too much in praise of your wonderful medicine. D. C. MACK.

BROWN'S IRON BITTERS does not contain whiskey or alcohol, and will not blacken the teeth, or cause headache and constipation. It will cure dyspepsia, indigestion, heartburn, sleeplessness, dizziness, nervous debility, weakness, &c.

Use only Brown's Iron Bitters made by Brown Chemical Co., Baltimore. Crossed red lines and trade-mark on wrapper.

NOTICE TO CREDITORS.

ESTATE OF ROSEMOND GREENWOOD, deceased.—Notice is hereby given by the undersigned, executor and executrix of the last will and testament of Rosemond Greenwood, deceased, to the creditors of, and all persons having claims against the said deceased, to exhibit them with the necessary vouchers, within four (4) months after the first publication of this notice, to the said executor and executrix, at the office of E. W. Blancy, Esq., attorney-at-law, No 526 Montgomery Street, the same being the place for the transaction of the business of said estate, in the City and County of San Francisco.

Dated at San Francisco, the 2d day of October, 1883.

GEORGE SPAULDING,
MARY WILLIAMS,
Executor and Executrix of the last Will and Testament of ROSEMOND GREENWOOD, deceased.

FOR SALE.

Globe Iron Works,

Foundry, Machine, and Blacksmith Shop.

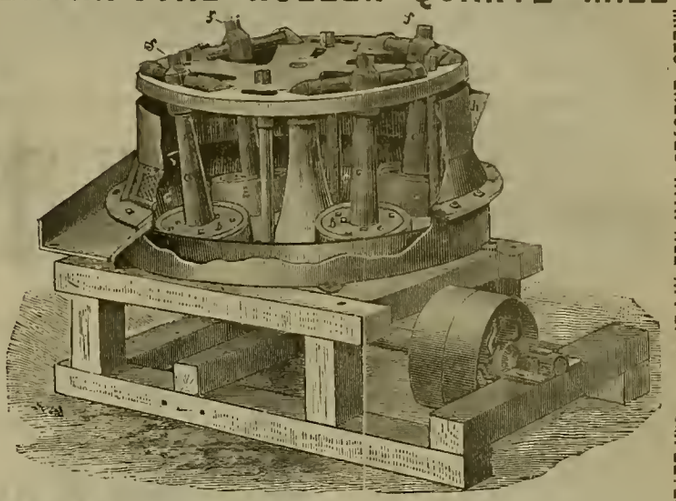
COR. MAIN AND COMMERCIAL STS.,
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Apply to JOHN CAINE, Prop.

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CENTRIFUGAL ROLLER QUARTZ MILL!

CAPACITY AND DURABILITY GUARANTEED.



MILLS ERECTED WITH ALL APPLIANCES COMPLETE.

After running one of those mills on the Wanden mine, in El Dorado county, over four months, and thoroughly testing its capacity and durability, I am prepared to offer it to the mining public, and claim for it the following advantages over the drop stamp mill:

1. The cost of same capacity is not more than one-half that of stamps.
2. Freight to mine one-fourth that of stamps.
3. Cost of erection at mine one-tenth that of stamps.
4. It runs with one-third the power per ton of ore crushed.
5. The wear is less than that of stamps.
6. The wearing parts are easily duplicated.
7. It has a much better discharge, and leaves the pulp in better condition for concentrating.
8. It is a better Amalgamator, saving fully nine-tenths of the gold in the mill; the balance can be saved on plates in the usual manner.
9. It is continuously crushing; not like the stamp, using power to suspend it in air ninety-nine one-hundredths of the time, and the balance making a thundering noise, and accomplishing *comparatively* small results. It is as far in advance of the stamp mill as the present method of making flour with improved rolls is over the Indian's mode of crushing corn in a stone mortar.

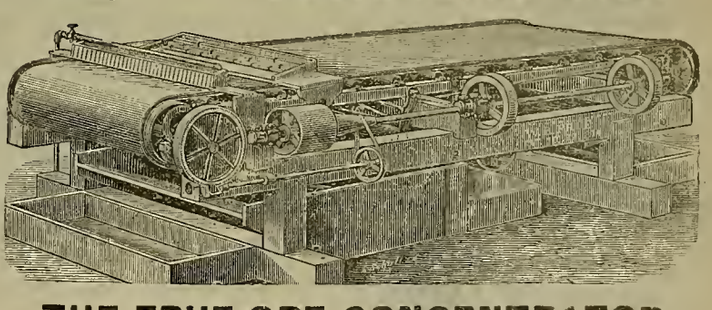
PATTEN'S CONCENTRATOR.

This machine requires less power, less care or attention, and is less liable to get out of repair than any concentrator now in use. All of which any practical miner will comprehend when seeing it in operation.

The wear and tear is nominal, and the construction so simple that any miner can put it up and run it; and the low price brings it within the reach of all mill men, as it will save enough to pay for itself in any mill in a very short time. One machine will concentrate the tailings from a five-stamp battery.

SHINGLE MACHINES AND SAWMILL MACHINERY OF EVERY DESCRIPTION.

$1,000 CHALLENGE!



THE FRUE ORE CONCENTRATOR,

—OR—

VANNING MACHINE.

Over 400 are now in use, giving entire satisfaction. Saves from 40 to 100 per cent. more than any other Concentrator in use, and concentrations are clean from the first working. The wear and tear are merely nominal.

A machine can be seen in working order, and ready to make tests, at the office of Hinckley, Spiers & Hayes, 220 Fremont Street.

To those intending to manufacture or purchase the so-called "Triumph" Concentrator, we herewith state:

That legal advice has been given that *all shaking motion* applied to an *endless traveling* belt used for concentration of ores is an infringement on patents held and owned by the Frue Vanning Machine Company

That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.

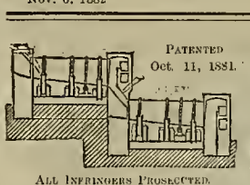
That the patent laws make *users* of infringements responsible as well as makers, and the public is therefore warned that there is considerable risk in purchasing any end-shake machine until our various patents have been decided.

That if there are those who for any reason prefer an end-shake machine, we can manufacture and sell to such machine of that description, as efficient as the Triumph, and at a lower price, and no liability for infringement will then be incurred by the purchaser.

That we shall protect ourselves against any one making, selling or using any machine infringing any of our patents. Patented July 9, 1867; May 4, 1869; Dec. 22, 1874; Sept. 2, 1879; April 27, 1880. Patents applied for.

That we are, and have been, ready at any time, to make a competitive trial against the Triumph, or any other machine, for stakes of $1,000.

ADAMS & CARTER, Agents Frue Vanning Machine Company,
Room 7. 109 California Street. - - - SAN FRANCISCO, CAL
Nov. 6. 1882



PATENTED Oct. 11, 1881.

ALL INFRINGERS PROSECUTED.

NEVIN'S CELEBRATED
Patent Ore Roasting and Chloridizing
FURNACE.

Working up to 93 per cent. of Fire Assay, using 25 per cent. less salt since July, 1882. LICENSES FOR USE NOR SALE, or FURNACES CONSTRUCTED. Address R. A. NEVIN, Patentee Box 1676, SAN FRANCISCO, CAL.

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258 Market St., N. E. cor. Front, upstairs, San Francisco
Experimental machinery and all kinds of models, tin, copper and brasswork.

FINE WOOD PHOTO-ENGRAVING
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IT WILL PAY YOU 702 CHESTNUT PHILA. PA.

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ROOT, NEILSON & CO.,
MANUFACTURERS OF
STEAM ENGINES, BOILERS AND ALL
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Flouring Mills, Saw Mills and Quartz Mills Machinery constructed, fitted up and repaired.
Front Street, Between N and O Streets,
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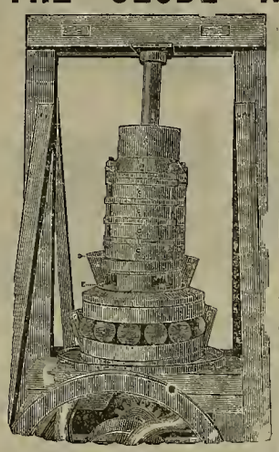
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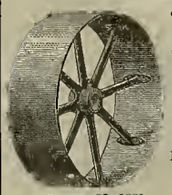
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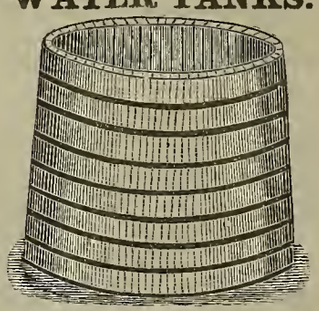
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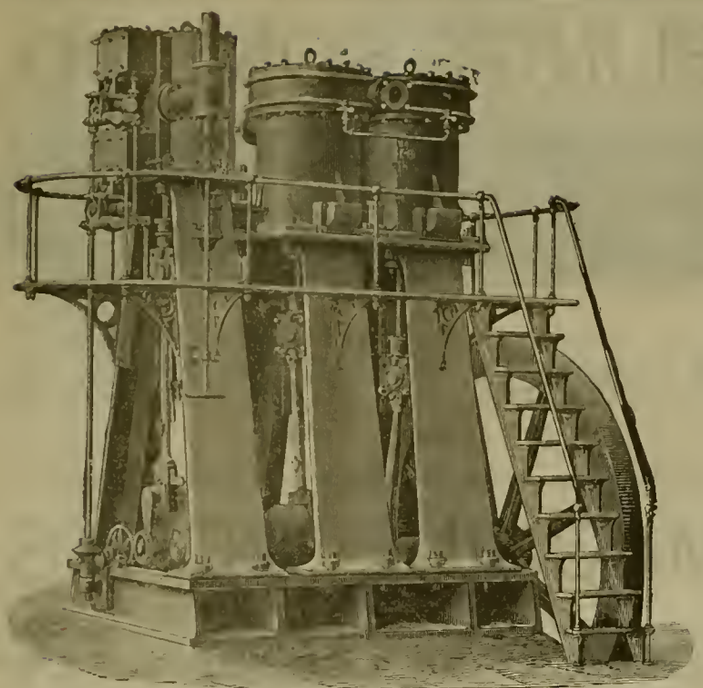
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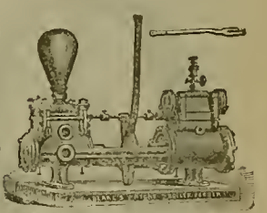


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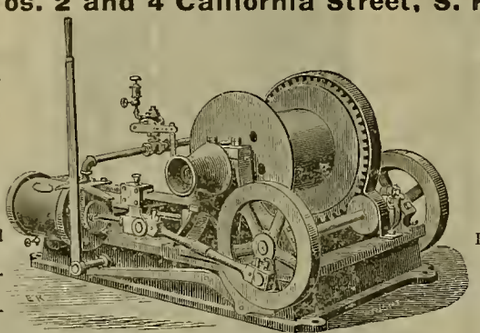


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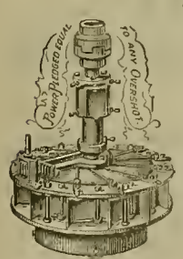
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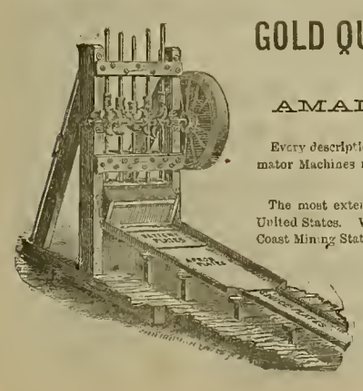
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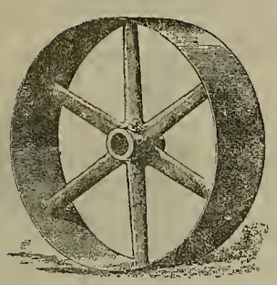
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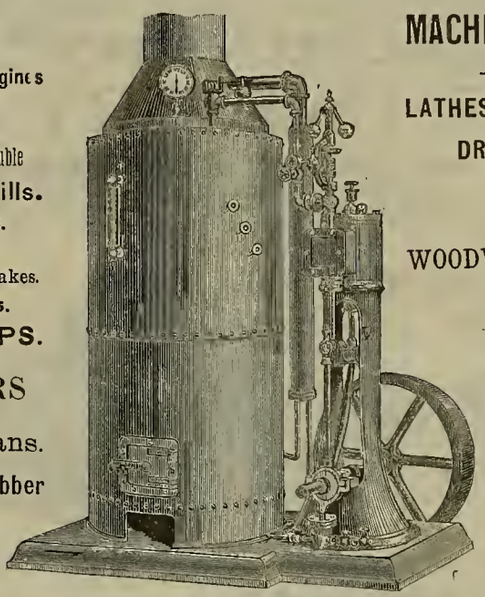
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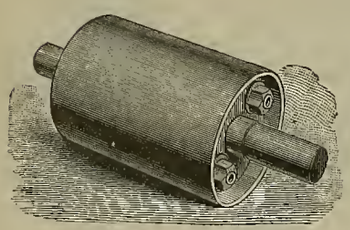
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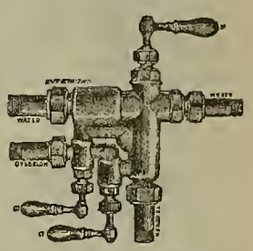
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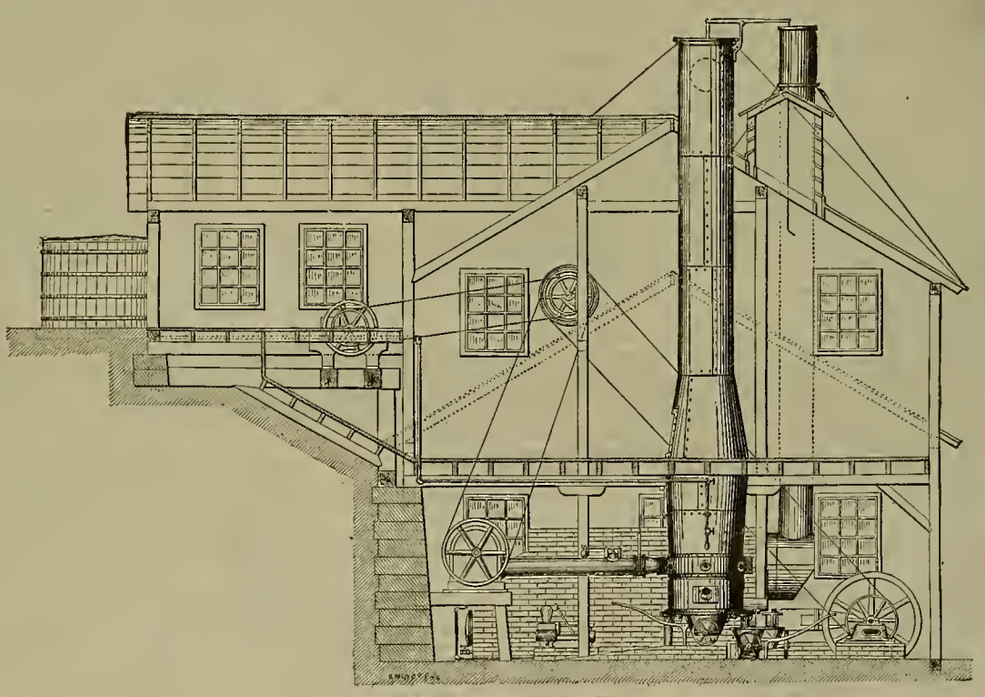
BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, OCTOBER 20, 1883.

VOLUME XLVII Number 16.

Copper Smelting Plant.

The practice with regard to smelting furnaces has changed very much in the past few years, and now water-jacket furnaces mainly are used for galena and copper ores. The furnaces and equipment are furnished complete ready for shipment, and very little time is lost in setting the outfit up on its arrival at the mine. The engraving on this page shows a complete smelting plant for copper ores, as built by Fraser & Chalmers, of Chicago, Ill., who make a specialty of the water-jacket furnace, and have fitted up a great many plants in different parts of the country. From their circular, giving the specifications for a thirty-ton copper-smelting plant, we take the following, showing, as it does, how many things are necessary aside from the furnace itself: Water-jacket copper-smelting furnace, with all latest improvements, including water-jacket made of wrought iron, 36 inches in diameter, 9 feet high, containing 6 tuyeres, wind-box, and improved water-circulating attachment; bottom plate, with dumping doors; four cast-iron columns for same; sheet-iron bonnet and smoke-stack, with guys; blast pipe, with necessary elbows and wind-valve; six improved slag pots, with cars attached; four hullion pots, with cars attached; hullion truck, dumping plate and track; pair of adjustable molds, and plate for slag brick; pair of hullion tongs; 350 pounds octagon steel furnace-bars; a four and a half Baker blower; No. 2 Blake crusher, 10x7, with extra set of jaw plates; belts for blower and breaker; fifteen horse-power 8x12 stationary steam engine for driving blower; twelve horse-power stationary steam engine for driving crusher. These engines are complete, including governor, foundation bolts, oil cups, main pulley, fly-wheel, etc. There is also a tubular boiler, 42 inches in diameter by 12 feet long; iron C. H. No. 1 flange used throughout; steam drum and mud drum; fire front grates, wall binders, back arch, soot door and frame; breeching No. 10 iron; smokestack 22 inches by 40 feet; 300 feet galvanized iron guy ropes; safety-valve, steam-gauge, and water-gauge; three register gauge-cocks; steam whistle; No. 3 Knowles steam boiler feed-pump; heater and exhaust pipe.



COPPER SMELTING PLANT.

The makers advise shipping with the machinery about 400 fire bricks and three barrels of fire clay. A furnace of the size described will require in the neighborhood of 25,000 gallons of water per 24 hours if allowed to run to waste. The greater portion of this water can be saved by using a reservoir and pumping back into storing tanks. By this method only about 3,000 gallons of water will be consumed per day. An extra steam pump will be required then for pumping. In all cases a steam pump should be taken to raise the water from the well to the supply tanks, if the source of supply is not so located that the water will flow into the works at the level of the supply tanks. With larger works, a single engine to drive every thing is recommended. In the furnace, 25 to 30 bushels of charcoal are required for each ton of ore, or one ton of coke to seven tons of ore, varying in amount according to character of both ore and fuel. For ores of base character, such as those containing sulphur, arsenic and antimony, additional appliances are necessary for driving off these substances before smelting. This can be done at small expense by roasting in heaps or in the various roasting furnaces made for the purpose. Sulphurets carrying silver can sometimes be worked to better advantage by reducing the whole product into a matte. The makers of this plant arrange the furnace stack so that a dust chamber condenser can be attached if desired.

ORIGIN OF THE UNIVERSE.—The well known Parisian editor, M. Moigno, has written a paper on the synthesis of the heavens and the earth. In this he makes the deduction that everything originated from ether, which first generated hydrogen. To an impulsation of ether he attributes the existence throughout the universe of the action of gravitation.

THE Treasurer of the Irish National League at Dublin has returned to the donors at San Francisco a draft letter for the benefit of the families of the Phœnix Park murderers, on the ground that the League would be placed in the attitude of encouraging assassination should it distribute the money.

A PERMANENT exhibition building is to be one of the attractive places of amusement in Baltimore, Md. It is to be built of brick, marble and iron, and is to cost $500,000.

Mules Underground.

Mules seem to be more useful about mining operations than horses. In running an arastra a mule is much better than a horse. He will get sly and shirk work if he can by going very slowly, but may be encouraged by rocks and other missiles to quicken his pace. He will stand this treadmill work well and thrive on it, while the nobler animal will wear out.

Underground the mule is preferable in many ways, and these animals are generally used there instead of horses. They are intelligent, and if they fall and are entangled, are apt to lie quietly while being released, instead of kicking and thrashing about to their own injury as a horse will do. Some people have a prejudice against them, alleging their tendency to kick, but underground they do not seem to do that, whatever may be the case above. They become very tame when underground. Mr. Sutro describes those in use at the famous tunnel as having become the miners' pets. He says the men become attached to them, and as the shaft mules pass along by the men at lunch, edibles are given them. When signal is given to fire a blast the mules understand the signal, and will try to get out of the way of it just as the men do. Of course the mules become accustomed to the darkness, and in going out into the sunlight can not see very well, and when they go back from the sunlight into the tunnel they can not see at all. At the Sutro tunnel they are in the habit of covering one eye of the mule until they go into the tunnel again, when the cloth is removed, so they have one good eye to see with. This plan had to be adopted, because the mule is so stubborn he will not pull unless he can see his way ahead. At this place another thing was found out about mules. They tried horses at first, but found that whenever anything touched the ears of a horse he would throw up his nose and knock his head against the roof; but if you touch a mule's ears he drops his head. The horses were given up, and mules answered very well.

Development Companies.

A new method of carrying on mining operations is shortly to be tried here which has some novel features that should make it popular both with miners and capitalists. The idea is to form a company which shall put up certain money for the purchase of mines. The first thing to do is to bond a number of small unprospected mines and prospect them, spending a few thousand dollars more or less on finding their value, and in case they develop well to buy them. Mr. John Hays Hammond, of the firm of Wagoner & Hammond, Mining Engineers, went East this week with the object of forming a company of this sort. Some gentlemen there, acting on his suggestions, propose forming a development company with a working capital of $250,000. If a miner has a good looking claim, with no money to carry it on and prospect it, the company proposes to bond it and prospect it themselves, with the privilege, previously secured, of purchasing at a stipulated price in case they think the property worth it.

It is intended to have experts examine these properties, of course, and two or three men may be kept in the field looking up favorable claims. It will of course be necessary to be careful in the selection of the mines to prospect, and to be also careful of expenditures in prospecting. In case of a few failures it will make little difference, provided a good mine is found occasionally.

Most men owning prospects ask too much for undeveloped properties, but it is thought that if they find the claims will be prospected they will be willing to bond on reasonable terms.

So confident is Mr. Hammond that his plan will work that he has given up a good position in Mexico to take up this system. He goes from here well recommended, and under favorable auspices. In his connection with the U. S. Geological Survey, the Census, and the Mint Director's work, he has become familiar with the mines of this state, and considers them preferable. There are very many good quartz mines here in California, now lying idle, which might be bonded for purchase with readiness. This plan seems in every way preferable to that of buying only one mine and spending many thousands to prove its value. By the system proposed, only those would be purchased which developments proved worthy, and those left on the owners hands would be better than when taken hold of, as far as developments were concerned.

THE arrival of the Carmel River water, conducted through the pipes of the Pacific Improvement Company, at an expense of over $500,000, was celebrated by the citizens of Monterey Sunday night.

Great Salt Lake.

A Voyage of Discovery on the Big Inland Sea.

With several members of the Agassiz Association an excursion trip was taken lately on Great Salt lake. Going out to Lake Shore on the swift little Rio Grande train, we landed in about half an hour and found our boat waiting for us. After stowing away our collecting bottles and cans, insect nets, egg baskets, hammers and other paraphernalia, we breathed easier, knowing that as long as they were out of sight no old toper would ask for a drink of our alcohol and corrosive sublimate, that no one would take us for perfumery and comb peddlers, nor wink with Western shrewdness at the idea of catching fish in the lake. At the pier we found the water only a foot deep, where two years ago it was three or four. Even the mud was furrowed up by boats which had come up to the landing.

Hoisting our sail we passed out toward the middle of the lake. For six or eight miles we sailed over water that was nowhere more than two or three feet deep. Some five or six miles out we struck broad patches where the bottom was covered with the dead shells of fresh water molluscs, washed in from Hot Springs lake, caught by the roots and stems of the salt grass and some bulbous plants, which forty years ago flourished there and were overwhelmed by the rising brine, and perfectly preserved for a generation. The water has so nearly reached its level of 1840 that the high waves wash up the roots and cast them upon the beach, where they are now to be found. The storm line of that year is now at the water's edge, and the ancient sagebrush that grew immediately behind it now stands like ghostly sentinels over their graves. For over forty years this same sagebrush has stood deep beneath the water, like the submerged forests of the Columbia river.

A stiff breeze soon sprang up from the south, and we went booming along in full view of Antelope (Church) Island, toward a dim, low island (Fremont's) to the north of it. Night dozed around us; midnight came and went, and just as Fremont Island loomed up in the darkness, a great red finger rose rapidly behind the distant Wasatch, and towering up, seemed to bend toward us as if to warn us not to disturb the island's solitude. The new moon never seemed so awe-inspiring nor more unlike itself as it rose half out behind the hills.

Fremont Island.

Ere long the gravelly shore of Fremont Island was reached, and soon all the party were fast asleep on the beach. One of them had taken the precaution to tie the halliard rope around his body, and in about two hours he found himself traveling toward the water, the strong waves having loosened the boat. About dawn he was again doubled up by the rope. Had it not been for this precaution, all the party would have graced the solitude with their presence, and the boat would have sailed alone. The next morning most of us studied the ancient beach of the island, and gathered splendid specimens of specular iron ore and slate. Our geological books informed us that the island was a mere pile of rocks, barren, and without water; what was our surprise, therefore, to find it smooth and rounded, with but few cliffs and dotted with sheep, which of course meant at least one good spring upon it. Descending to the shore, we found the sand to be angular, like that of the ocean and most fresh water lakes, this being almost the only place where the peculiar oolitic (egg-shaped) sand of the lake is absent.

Soon we were on our way toward the hazy western shore. As we passed along, the seagulls circled around us or floated on the water, their white plumage shining in the sunlight. Every now and then a hawkmoth would flit by or alight on the boat, dragon flies would stop long enough to gaze at us curiously and then spin off toward the distant islands. Occasionally a 17-year locust would hum past as if to mock at us for ever daring to believe that this is the

"Dead Sea of America."

As the bow plowed through the water millions of small *diptera* (flies) would rise from the water, where they were resting, and cover the bow of the boat till quarts of them could be collected. Wherever we went we observed the same thing. The water of the lake is their home, and they are as much at ease sitting on the water as a skipper is on an eastern pond. In some places when it is calm these flies darken the water for miles. Here (not on the beach) they lay their eggs; here they hatch, and here the larvæ live by the million till ready for the pupa state, when they attach themselves to the seaweed (floating everywhere in the water) and remain till they emerge as perfect flies. The larvæ doubtless prey upon the strange little shrimps that live in the water. There are infinite numbers of these, as there is scarcely a place in the lake where a bucket of water can be dipped without taking up from 20 to 500 of them. It is strange that people should call this a "dead sea," for though the number of species does not exceed 10 or 15, there is no lake, fresh or salt, in the world that contains half as many living things as Great Salt Lake.

Small Islands.

In the course of the forenoon we reached and explored several small islands near the western shore, then passed around the northern shore of

Stansbury Island.

This is the most interesting of all the islands of the lake. We had previously explored it, finding some very rare plants, insects and fossils. The eastern side is indented by numerous open bays, which sweep from point to point in arcs of circles like so many bended bows. The beach is composed of fine white sand, free from boulders, and slopes quickly to the water, where it forms a beautiful bottom. A few rods from shore the water is deep enough to satisfy the most fastidious, thus making the most delightful bathing places on the lake. The view obtainable from the island's lofty peaks is unexcelled.

Leaving Stansbury behind, we sailed for the north shore of

Antelope Island,

Passing over the deepest water in the lake. When we reached the shore the breakers were rolling so high that we could not land. Passing around the point we soon reached some springs of water where we quenched our thirst and refilled our empty cask. Here we saw considerable stock upon the hills.

The remainder of our trip to Lake Shore was without incident till we had almost reached the landing, when a terrific squall dropped upon us from the mountains near by, and almost lifted us out of the water. The waves hissed by and almost laid bare the bottom; when they struck us it seemed like so many Titan sledge hammers trying to shatter the boat. There is probably but one sea in the world where the shock of the waves is so terrific, not from the force of the wind, but from the extreme heaviness of the water. Though the lake has the reputation of being treacherous, we soon learned that it has some very good points. From 5 A. M. to 4 P. M. the wind usually blows steadily from the north or northwest; then there is a calm of an hour or two, when it blows from the south nearly all night.

Our three days' sail of 110 miles was voted a success by all. The breezes were comparatively gentle, not frightening anybody (as they did on a former trip, when the waves were seven feet high); the heat was not intense, the sea seemed so like a fresh water lake, and animal life was so abundant in and around it that we shall never again call this the "Dead Sea of America." MARCUS E. JONES.

Money for the Mines.

While primarily all our money comes from the mines, a good deal has to be expended in order to procure the raw material for coinage. Mining developments in this and adjoining states and territories have, for the last quarter of a century, been mainly carried on through incorporated capital, or rather through incorporations that call in their capital as needed, by means of assessments on outstanding shares. During the current month twenty-three assessments will become delinquent at the respective offices. Seven of these mines are in Nevada, twelve in California, one in Utah and three in Mexico. It is noteworthy that, so far as known at this office, no assessments are to become delinquent this month on mines in Arizona, Dakota or Idaho, though it is possible there may be some in each of these sections. The Mexican Mining Company is calling for the largest amount of money this month. The stockholders in this mine have paid up quite generally and promptly heretofore, and it is presumed they will respond to the present call in the same way. Following is a list of the assessments to become delinquent during the month of October:

Name.	Per Share.	Amount.	Del. Oct.
Best and Belcher	$0 50	$50,400	24
Campo Seco Copper	10	10,000	1
Con. Amador	50	15,000	20
Con. Reforma Lead	15	4,500	17
Christy M. and M.	20	12,000	31
Day	30	30,000	15
Detroit Copper	10	5,000	22
Double Standard	10	5,000	..
Eintracht Gravel	5	5,000	17
Eureka Consolidated	1 00	50,000	22
Gorilla M and M	10	5,000	3
Hale and Norcross	50	56,000	16
Mexican	1 00	100,800	23
McClinton	5	3,000	4
Mt. Potosi Con	25	25,000	30
Pleasant Valley	15	15,000	16
Red Hill Hydraulic	5	5,000	5
Ruby Gold Gravel	25	25,000	30
Silver Hill	5	5,400	8
San Miguel and L. T.	1 00	50,000	11
Trinity Gold	10	3,000	22
Winthrop	25	2,500	23
Yaquai	10	5,000	17

The Best and Belcher, Hale and Norcross, Mexican, and Silver Hill mines are in Storey County, and the veterans in the assessment field, having levied 27, 78, 24 and 19 assessments respectively. The Hale and Norcross is the only one of the five that has paid dividends, and the account between that mine and its stockholders runs somewhat as follows:

Assessments levied	$4,174,000
Dividends paid	1,598,000
In debt to stockholders	$2,576,000

The other three mines have been a dead loss to stockholders from the start. The amount of the respective levies has been as follows:

	No.	Amount.
Best and Belcher	27	$1,446,600
Mexican	24	2,909,800
Silver Hill	19	1,819,800
Totals	70	$6,176,200

These mines are apparently just as far from reimbursing stockholders as at any time in the past five years. How much longer they will be able to collect capital in this way without making any returns it is impossible to say, though it is evident that unless there shall soon be something more encouraging in sight than at present appears in the Comstock mines, it is going to be more difficult to collect assessments than it ever has been.

The other three mines in Nevada are the Day, in Lincoln County, Eureka Consolidated, in Eureka County, and Mt. Potosi, in Esmeralda County. This is the sixtb assessment on the Eureka Consolidated, and the total is $300,000. The mine has paid seventy-five dividends, amounting to $4,817,500. The Day has levied thirteen assessments of $190,000, and the Mt. Potosi ten of $200,000. Neither mine has paid a dividend. Four of the California mines are in Mono County. These are the Detroit copper, Double Standard, Gorilla and McClinton. This is the first tax on the Detroit, and the amount is estimated. It is the only copper mine in that county, so far as we know. The Double Standard has made six calls on stockholders, amounting to $52,500; the Gorilla, two, both this year, amounting to $10,000, and the McClinton nine, amounting to $116,000. The Eintracht Gravel and Ruby mines are in Sierra County, and the former has levied thirteen and the latter nine assessments. The Campo Seco copper mine, in Calaveras County, has levied two assessments this year, both of which are estimated at $15,000. The Consolidated Amador is in Amador County, and used to be the banner quartz mine of the state. As the Amador and Consolidated Amador it has paid several hundred thousand dollars in dividends. This is the sixth assessment under the present organization. The Pleasant Valley mine, in El Dorado County, paid several dividends last year, and this year has levied two assessments of $30,000. The Red Hill hydraulic mine, in Butte County, has levied nine assessments. This is the first assessment on the Trinity, in Trinity County, and the Winthrop, in Shasta County. The Christy mine, in Washington County, Utah, makes its first demand on stockholders this month, after paying several dividends. The Consolidated Reforma lead mine is in Mulege district, Lower California, and this is the third assessment. The San Miguel and La Trinidad mine is in Chihuahua, Mexico, and this is the third assessment, and the Yaqui mine is in Sonora, Mexico, and this is the second call. The money demands of the mines will be apportioned as follows:

Nevada—		
Storey County	$212,600	
Eureka	50,000	
Lincoln	30,000	
Esmeralda	25,000	$317,600
California—		
Mono County	18,000	
El Dorado	15,000	
Amador	15,000	
Calaveras	10,000	
Sierra	7,500	
Butte	5,000	
Trinity	3,000	
Shasta	2,500	76,000
Utah		
Washington County	12,000	12,000
Mexico		
Chihuahua	50,000	
Sonora	5,000	
Mulege District, L. C.	4,500	59,500
Totals	$465,100	$465,100

For the corresponding month last year, 26 assessments became delinquent, amounting to $503,900. Assuming that all the assessments levied on mines to become delinquent in the first ten months of the year have been or will be collected, the amounts may be apportioned as follows:

	1882.	1883.
Nevada	$4,383,825	$3,690,590
California	1,116,117	1,136,044
Dakota	95,000	.....
Arizona	220,450	142,000
Utah	30,000	32,000
Idaho	19,000	.....
Alaska	23,000	19,750
Mexico	95,800	197,500
Totals	$5,782,452	$5,217,884

For the same time in 1882 the amount was $7,817,800, against $11,179,400 in 1880, and $13,137,600 in 1879. We are not levying any more than half as much as we did three years ago, and it is safe to say that the proportion of the levies collected is much less. We know of several instances of default this year, and some of them for large amounts. But as all the assessments levied do not come under our observation, the omitted levies will probably make good the delinquencies in those reported. There certainly must have been some levies in Dakota and Idaho this year, and more in Arizona and Utah than we have reported above.

THE BIG ENGINES.—About 13 of the big engines are going to be put to hauling freight in the mountains between Truckee and Rocklin very soon. There is to be a new departure in the manner of hitching up the trains from anything ever practised on this coast. Instead of putting all the engines ahead, they will be divided, and one or two put in front and one behind. In order to do this the cabooses must be changed and have powerful buffers. The pilots of the engines are also being changed, and "stub pilots," as the boys call them, are being put in, so as to let the engines close up to the car they are coupled to. This permits the use of a link in coupling, instead of a draw bar, which might double up. Mr. Cooley, the master mechanic, says the engines are all right and are a complete success on the Tehachipi hill, and will be here. They pull 15 cars, while 2 of the old engines will pull 16. The big mammoth engine now building will be out in about two months.—*Reno Gazette.*

The Oil Interest of Southern California.

Few persons who have not given especial attention to the oil interest in this portion of the state realize its importance. A casual trip only through the region in which the oil developments are being made gives no idea of the results already accomplished. Take the Newhall or Pico district, for instance. The oil output of this district has averaged during the last year more than 1,000 barrels per day, of an average value of $2 per barrel, or in round numbers 365,000 barrels per year, of the total valuation of over $700,000. All this has been derived from a very limited area of territory, not over 1,000 acres all told.

So great has been the success of the parties who have inaugurated this enterprise at Pico, that they have determined to enlarge to an enormous extent their field of operation, and take in the whole of the Santa Clara Valley, containing an oil area of many hundreds of thousands of acres. Already have they formed corporations for pipe lines down the valley to Ventura, and the pipes are laid from Santa Paula down to the sea. In addition, there is piled up at Newhall large stacks of pipe, which would seem to be more than enough to pipe all the way from Newhall to Santa Paula and connect the wells already productive with the sea.

Companies of parties from Pennsylvania have been formed for putting down additional wells, and derricks are rising in all directions on the mountain sides of the Santa Clara. There are also piled up at Newhall large piles of pipe, six, seven, and eight inches in diameter, to be used in casing wells now being put down, or to be put down in the immediate future. The indications now are that more than one hundred wells will be put down in this valley alone in the next six months, and the output more than doubled.

Already is this the second oil-producing field in this country, and with the energy and pluck now being shown, it will not be many years before Pennsylvania, so long the oil monarch of the world, will be obliged to look to its laurels.

This increased development can be of incalculable value to our sister county, Ventura, and to its principal port, San Buenaventura. With a million or more of dollars flowing into it from its oil exports, with the increased valuation given to its productions by a home market established by the oil industry, Ventura County must, in the immediate future, receive a boom which will add a greatly increased value to its lands and prosperity to its people.

Without any jealousy of Ventura and its riches, we can call attention to the fact that the surface indications of oil in Santa Barbara County are every whit as good as those in Ventura, and that beyond question oil lies within the limits of this county, only needing stirring activity and business energy to bring it forth. Who will inaugurate this enterprise and put down a well, not 200 feet deep, but 2,000 feet, if necessary? There may be risk, but if successful the result will more than compensate for the risk run.—*Santa Barbara Independent.*

Wyoming Oil.

In the Sweetwater country in Wyoming, there are large deposits of petroleum. Dr. G. B. Graff, of Omaha, several years ago improved the springs there by digging some reservoirs to collect the oil and store it to hold for market. This oil has been used for several years for lubricating axles and machinery on the Union Pacific, and has gained a fine reputation for its excellent qualities. To make the oil property profitable, Dr. Graff has been engaged in organizing capital to develop it, and the result of his labors are set forth in the Omaha *Bee*, as follows:

"Dr. Graff, of Omaha, who is engineering the development of the oil field of Wyoming, has returned from a visit to England, where he is supposed to have secured the necessary capital for active work. The company, of which he is the working head, proposes to erect a large refinery at Point of Rocks Station, which is situated sixty-nine miles south of the oil fields. This will have a capacity of 3,000 barrels of refined kerosene per day. A pipe line will be built to the wells, at a cost of $225,000, to convey the crude oil, and bull trains will also run between the wells and Point of Rocks, transporting lubricating oil.

"The oil, in transit through the pipe line, will have to be carried over an elevation of 2,000 feet, but heavy pumps will do the work. Dr. Graff expects to have the pipe line in operation this fall, and the refinery under roof. A Pennsylvania expert, who recently examined these oil fields, thinks that the oil, if found in the paying quantities he anticipates, will be used principally as fuel for smelting the ores which are found in such abundance in the mountains of the territory. Smelting is now a very expensive process, as coke ranges in price from $25 to $80 per ton. Petroleum produced at the price now ruling in this region would cost but $7 per ton, and a ton of petroleum would do about three times the work of a ton of coke. It would undoubtedly, in time, prove a vigorous competitor of Pennsylvania oil for lighting purposes, as refined petroleum now sells in the territory at 20 cents per gallon. With continued growth of the West, there will be no lack of a home market for all that can be produced."

MECHANICAL PROGRESS.

The Cost of Wrought-Iron Framing.

Mr. P. Barnes, in an article in an exchange, remarks that it is a fact quite worthy of note in connection with the use of wrought-iron bars and plates, in the more modern designs of roofs and other similar framed-work in buildings, that the amount of what may be called blacksmith's work, or forged pieces, has steadily diminished in quantity and complexity, until now there is very little of it left. This fact does not by any means indicate that the fitting or joining of the parts has been slighted or been done carelessly, but it is due to the constant study of those who plan such work to simplify the whole, so that the usual range of work called for may be reduced in cost to the lowest practicable limit, and also, an equally important thing, so that there may be the largest possible inducement for the use of such work in new directions.

This need of simplicity of construction and of reduced cost has led to the furnishing by many rolling mills of bars of a great variety of forms, so that in the use of them, even in a complicated piece of framing, the only hand labor that need be done is found to be the bending, or twisting, or flattening out of these bars, all of which can be done at a comparatively low heat, and by men of very moderate skill. The joining of such parts has come to be almost wholly a matter of the fitting of plain pins, turned for the more important work, and the driving of rivets, all of which involve care and skillful oversight, but no special skill on the part of the individual workmen themselves. For some of the tension rods and similar parts of iron frames there will probably always be some welding needed, as these members are usually made of the best iron, and hence, to save cost, must be kept as light in weight as possible. Hence the need, in the ends of these parts, for joining them one to another, of a welded eye, so that the fullest strength shall be maintained for the size of the bar used, or, more correctly, so that the full strength shall be preserved throughout every part of it when made up into the finished form. In the forming and welding of these eyes, the smith's work is of the most elementary sort, the bending of the end back upon itself and the making of the simplest form of a scarf weld being the whole of it.

The great care which has thus been given to these details of design, both in the ideas involved in the combination of parts and in the putting of them into the forms of actual construction, has led to very large reductions in cost price of all such work, and hence to an expansion of the business of making wrought-iron framed-work, which is nearly incredible, even to those who have been familiar with each step of this advance during its progress.

Transmission of Power.

The distance to which wire-rope transmission can be applied ranges from fifty or sixty feet up to miles. "As a magnificent example of long transmission, we would mention that of Schaffhausen, in Switzerland, at the falls of the Rhine. Here eight hundred horse-power is carried diagonally across the Rhine, and extended for a distance of two miles and distributed among fifty different manufactories, situated in every imaginable position and embracing all the varied arrangements of changing directions."

Wire-rope transmission comes into use at the point where a belt or line of shafting becomes too long to be used profitably; and in point of economy it is much cheaper than its equivalent in either shafting or belting. This method has been largely introduced with great success in Europe for several years past, and is now receiving a rapid development in this country.

Power can by this method be transmitted in any desired direction, up or down hill, across rivers, around buildings or obstructions of any kind, and thus make available many sources of power which are now useless. The ropes hang free in air, and require no protection from the weather, excepting an occasional coat of warm coal-tar, which can be applied to the rope by pouring from a can into the groove of the wheel while running; or raw linseed oil can be swabbed on the rope to keep it from rusting, and thereby preserve it.

In the neighborhood of Frankfort-on-the-Main, in Germany, the power of a hundred horse-power turbine is conveyed for a distance of 3,200 feet, by means of a wire-rope transmission, to a cotton factory located in the proper place, for such a building—wheels of thirteen feet and a half; size of rope, five-eighths inch. A nearer site for a building could not be found, and this was the only way in which the power could be made available for that purpose.

Hundreds of cases similar to the above might be referred to in Europe, where permanent rope transmissions are numbered by thousands.—*Popular Science News.*

COMPOUND LOCOMOTIVES.—M. Mallet communicates to the French Society of Engineers a note from M. Borodine, giving the results of experiments to determine the relative economy of the simple and the compound system of engine for locomotives. The engines experimented with were those designed for the railway from Bayonne to Biarritz by M. Mallet. The trials extended over a considerable period of time, and the comparisons were made fairly complete. The result showed the compound system to have an economy of from ten to twenty per cent, according to the conditions under which they are carried out. The variation in the ratio of expansion is very greatly restricted in the compound engine. The use of the steam-jackets with which the engines were provided did not prove to be of advantage. The expenditure of steam was greater when they were in use than when they were shut off.

A Wooden Boiler.

While we hear of so many substitutes for wood as to make the hearts of the forest denudation alarmists beat for joy, it is very rarely we hear of forest products being put to a use for which wood has been hitherto deemed entirely impracticable. Such a case, however, has just come to our notice, and strange to say, it is not a Yankee invention either, and did not originate in the Land of Wooden Nutmegs, but is to be credited to the inventive genius of a New Jersey youth. It is said: "A Patterson, N. J., mechanic, named William Sutcliffe, is building a steamboat with a wooden boiler, which will be placed in the Passaic River above the falls in a few days. The boat is a propelier, 16 feet long. The boiler is made of a new alcask, and is said to be capable of standing a pressure of 200 pounds to the square inch. It has already been satisfactorily tested at 40 pounds pressure. This novel boiler is fitted with flues, and the fire, instead of being under, is on top of it, a draught being supplied by a tube from underneath. Mr. Sutcliffe is a thorough and practical mechanic, holding a responsible position in one of the Patterson locomotive works. It is the first time in history that an attempt has been made to raise steam in a wooden boiler, and it looks as if the experiment would prove a success."—*Cotton, Wool and Iron.*

LONG OR SHORT RAILS.—Bearing upon the question of long and short rails, it may be of interest to state that the first line opened in France, viz., that from Saint Etienne to Andrezieux, had rails only 3 feet 11 inches long and weighing 45 pounds. This was in 1828; but in 1832, on the line from Saint Etienne to Lyons, the rail had increased in length to about 14 feet 8 inches and weighed 132 pounds. Various increases were made up to 1855, in France, when the length reached 49 feet 6 inches. England came in with a rail measuring from 21 to 24 feet, with a weight of 110 pounds per 39 running inches. In Austria the Francis Joseph line far exceeded this length, but was one-eighth less in weight. The great objection to the lengthening of iron rail is that the rail exfoliates and is damaged at any point; in fact, the Southern of France Railway Company finds that only one-third of the rails are damaged at the ends. The greater length also involves more labor in the removal and replacement of rails. The use of cast-steel changed the whole question, and now rails are turned out in Belgium and France 85 feet in length. The long rail adopts a curve more readily, owing to the absence of joints. Considering the dilation owing to changes of temperature, the maximum length of a rail in France is thought best to be about 49 feet 3 inches and weighing 110 pounds.

WEAR OF IRON WORK.—In a comprehensive article recently written by Herr Wohler, he enumerates the various kinds of injury and wear to which axles, tires and rails are subject, and remarks that under normal circumstances railway material is not forcibly torn, bent or broken, and that when such violent force is brought to bear on it, then the limit of human precaution has already been passed. On the other hand, he considers that scientific tests have to be arranged in view of those small and sometimes almost imperceptible movements which, by their frequent repetition, affect the durability of the material subjected to their influence. The test applied by the Imperial railways of Alsace-Lorraine, of which Herr Wohler is manager, in the acceptance of axles, involves the sample bar being subjected to a load of 34.92 tons per square inch of the cross-section during ten minutes, without any further extension taking place during that time. If this test is withstood, the bar is subjected to a further weight until it is broken. After being broken, the cross-section of fracture must not exceed 65 per cent of the original cross-section.

PENNING'S STEAM JOINT.—An improved steam and hydraulic joint, invented by Mr. E. Penning, of London, England, attracted some attention at the recent engineering exhibition. According to Mr. Penning's system, the flanges of the pipes are furnished with grooves of a triangular shape, into which rings of a similar section are inserted, forming, when the joint is made, a triangular or wedge-shaped washer, of which the apex is nearest the periphery. The washers are made of prepared or ordinary India-rubber patent packing, asbestos, or any other suitable material. It will be understood that, from the form and position of the washer in the joint, it will resist considerable pressure. It is said to have been tested under a hydraulic pressure of 4,000 pounds, and to have given entire satisfaction.

SCIENTIFIC PROGRESS.

Ancient Glaciation of North America.

While the glacial area on our continent has not been fully explored, there is abundant proof for the following propositions: First, Glaciers covered most of the elevated portions of the mountain belts in the Far West as far south as the thirty-sixth parallel, and in the eastern half of the continent to the fortieth parallel of latitude. Second, The ancient glaciers, which occupied the area above described, were not produced by local causes, but were evidences of a general climatic condition. Third, They could not have been the effect of a warm climate and an abundant precipitation of moisture, but were results of a general depression of temperature.

The traces of glaciation are similar in kind and apparently in date over the whole area; they are therefore effects of general, not of local, causes. East of the Mississippi the evidence is even more widespread and impressive than in the Far West. The area bearing marks of ice action, and strewn with drifts, extends from New England westward parallel with the Canadian highlands, in a belt 500 miles wide and over 2,000 miles long. Its northern extension has not been traced beyond Winnipeg, but there are reasons for believing that it reached to the Arctic Ocean, and that the great lakes are pre-glacial river valleys, scooped out and modified by ice. Fully half the continent north of the thirty-sixth parallel was glaciated. So far as we now know the glaciation was synchronous.

The iceberg theory was opposed by Dr. Newberry on the following grounds: It postulated a water line with irregularities of level that are irreconcilable. The direction of the scratches and the lines of deviation of the bowlders require that the northern portion of the continent should have been all submerged, leaving no land for the origin and starting point of icebergs. If the icebergs could have been formed and floated, an incomprehensible tangle of ocean currents would be required to account for their movements. The evidence of sea-covering, in the form of marine shells, is totally absent from the great drift area of the interior, while they are found abundantly in the Champlain and bowlder clays of the coast. Finally, the inscription left by the eroding agency is characteristic and *sui generis*.

The record of the ice period on our continent is far more extensive and impressive than it has been represented. The phenomena were due to an extraneous and cosmical cause, not to any local or even telluric. The question here passes from the geologist, and must be addressed to the astronomer. Professor Newberry briefly recapitulated some of the theories which have been suggested by Croll, Newcomb and others to account for the glacial epoch.—*J. S. Newberry, of New York, in Science.*

The Comet.

The comet recently detected by W. R. Brooks, at Phelps, N. Y., has become an object of unusual interest since its identification with the comet of 1812, the return of which has been anticipated about this time.

The comet has exhibited phenomena of great interest in regard to the development of its structure, by its approach to the sun. When first observed this year, it was a very faint and small nebulous object, but the appearance of a stellar nucleus was noted. The nucleus was afterwards less distinct. This may have been due to unfavorable conditions of observation, or it may possibly indicate a preliminary series of changes like those which the comet has just exhibited. On September 21st, as seen at Harvard College Observatory, the comet was still very faint. A slight condensation at one place could be seen with the large equatorial, but this could hardly be called stellar. The next night, September 22d, the appearance of the comet had so completely changed that it was difficult to believe it the same object previously seen. It now resembled a star nearly as bright as one of the eighth magnitude. Very little nebulosity could be detected about it, but some was seen early in the evening, while the comet was sufficiently high in the sky. During the evening it appeared to be gaining perceptibly in brightness. The next night, September 23d, it was seen at times between clouds, and was found to have again changed its appearance. It was now even brighter than before, although still slightly inferior to a star of the eighth magnitude, but it had lost its stellar appearance, and had become blurred, regaining the ordinary character of a cometic nucleus. Traces of the development of a tail were also perceptible. The rapidity of this series of changes is very unusual, if not unexampled.

The comet will doubtless soon become visible to the naked eye, and will prove an interesting object; but from its position it can not be expected to rival the beautiful comets of recent years either in proportions or brilliancy.

MEASUREMENTS OF THE DEPTH OF SLEEP.—Two of Vierordt's pupils, Monninghoff and Piesbergen, have made the depth of sleep the subject of an investigation. They worked upon the principle that the depth of sleep is proportional to the strength of the sensory stimulus necessary to awaken the sleeper, that is, to call forth some decisive sign of awakened consciousness. As a sensory stimulus they made use of the auditory sensation produced by dropping a lead ball from a given height. The strength of the stimulus was reckoned, in accordance with some recent investigations of Vierordt, as increasing, not directly as the height, but as the .59 power of the height. For a perfectly healthy man, the curve which they give shows that for the first hour the slumber is very light; after 1 hour and 15 minutes, the depth of sleep increases rapidly, and reaches its maximum point at 1 hour and 45 minutes; the curve then falls quickly to about 2 hours 15 minutes, and afterwards more gradually. At about 4 hours 30 minutes, there is a second small rise, which reaches its maximum at 5 hours 30 minutes, after which the curve again gradually approaches the base line until the time of awakening. Experiments made upon persons not perfectly healthy, or after having made some exertion, gave curves of a different form.

Photographing Reichenbach's Flames.

The question of the actual existence of these flames surrounding the poles of powerful magnets has again been brought up for discussion in scientific circles. Numerous persons have claimed to be able to see them, and some even to be able to distinguish between the poles and color of the flames. Reichenbach himself attempted to photograph them by the daguerreotype process, but was apparently dissatisfied with the results he obtained. Mr. William Brooks has taken the matter up, and thinks he has obtained actual impressions of the flames, by means of photography, on sensitive dry plates prepared especially for the purpose. In total darkness a perforated blackened card was placed one-eighth of an inch above the poles of a permanent horseshoe-magnet, and a sensitive plate placed an eighth of an inch above the card. With five minutes' exposure he obtained a result; and this was repeated many times, the most remarkable thing being that sometimes he obtained a positive and sometimes a negative image, under precisely the same conditions. Another curious effect obtained was, that some printed matter, which was under the wash of Indian ink, used to blacken the card, was perfectly readable when the plate was developed. This latter result, however, was obtained on only one occasion. He also succeeded in obtaining prints through a glass plate on which were painted figures in black varnish. This was contrary to the experience of Reichenbach, who considered that the rays were not transmitted through glass.—*Science.*

PRIMEVAL TINDER.—There are some kinds of mushrooms, notably the woody and leathery ones, that no more suggest ideas of a meal to us than a log of timber or a pair of old boots do. But if we do not think of eating them, we can fashion them into excellent razor strops or other useful articles on occasion. Several polypores make first rate tinder, and for such purpose they have undoubtedly been used from very remote times. We infer that fires were kindled by their means in the ancient Swiss lake dwellings, from the fact that they occur among the remains in almost every one of these old habitations. The common tinder polypore has also been found in the lake dwellings at Lochlee, in Ayrshire. Perhaps they may have been put to some other use. These old lake dwellers were probably not without their vices, and may have pounded polypores to dust and snuffed that up as eagerly as certain natives of Northern Asia do at this day.—*Good Words.*

THE discovery of M. Heddehault is proving of considerable value. When cotton and wool are combined, he subjects the material to superheated steam, under a pressure of five atmospheres. The wool soon melts and falls to the bottom of the vessel, leaving the cotton or other vegetable fiber clean and in a condition suitable for paper-making. Afterwards, the melted wool is evaporated to dryness, when it becomes completely soluble in water, and is called azotine—a substance very rich in nitrogen, and of great agricultural importance.

MICRO-ORGANISMS IN WATER.—Osmic acid possesses the property of hardening protoplasm, hence microscopists make use of it for detecting animalcules in water. According to L. Maggi, the chloride of palladium may be substituted for the more poisonous osmic acid, an acid more dangerous than prussic acid. By adding to the water a solution of palladium chloride (one in eight hundred), he obtained a precipitate in which the bacterial forms could be recognized under the microscope just as distinctly as in those obtained with osmic acid.—*Gazz Chim.*

TESTER'S TELEPHONE.—M. Tester, of the French Telegraph Administration, has devised a magnetic telephone which has given good results. It resembles a watch, with the glass replaced by an ebonite mouthpiece. The iron plate vibrates before a double magnetic ring, having projections like the indented edges of two concentric cups. The magnetic polarity is different in the two rings, one ring presenting north and the other south poles. Each ring is provided with a fine coil of wire, and the entire magnetic field is traversed by the current.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Best & Belcher M Co	Nevada	27	50	Sept 18	Oct 24	Nov 16	William Willis	309 Montgomery st
California M Co	Nevada	9	20	Oct 1	Nov 7	Dec 5	C P Gordon	309 California st
Champion M Co	California	13	10	Oct 8	Nov 15	Dec 8	Theo Wetzel	522 Montgomery st
Con Amador M Co	Nevada	6	50	Sept 15	Oct 20	Nov 13	F B Latham	408 California st
Campo Seco Copper Co	California	2	10	Aug 10	Oct 1	Nov 20	D Buck	309 Montgomery st
Day S M Co	Nevada	13	30	Sept 7	Oct 15	Nov 12	E M Hall	327 Pine st
Double Standard M Co	California	6	10	Aug 30	Oct 5	Oct 25	G W Sessions	309 Montgomery st
Eko Con M Co	Nevada	2	15	Oct 6	Nov 12	Dec 4	F Sperling	309 California st
Eureka Con M Co	Nevada	7	10	Sept 27	Nov 10	Nov 30	A F Main	418 Jackson st
Eintracht Gravel M Co	California	13	05	Sept 11	Oct 17	Nov 5	H Kunz	209 Sansome st
Eureka Con M Co	Nevada	6	1.00	Sept 23	Oct 22	Nov 12	P Jacobus	309 Montgomery st
Gorilla M & M Co	California	2	21	Aug 23	Oct 3	Oct 31	A A Enquist	436 Montgomery st
Hale & Norcross M Co	Nevada	78	50	Sept 11	Oct 16	Nov 6	J T Lightner	309 Montgomery st
Mayflower M Co	California	20	15	Oct 4	Nov 6	Nov 22	A Morizio	328 Montgomery st
Martin White M Co	Nevada	16	25	Sept 22	Nov 7	Dec 6	J J Scoville	309 Montgomery st
McClinton M Co	California	9	05	Aug 30	Oct 4	Oct 24	G W Sessions	309 Montgomery st
Mexican M Co	Nevada	24	1.00	Sept 17	Oct 23	Nov 13	C L McCoy	309 Montgomery st
Pleasant Valley M Co	California	2	15	Sept 8	Oct 16	Nov 3	C E Elliott	327 Pine st
Ruby Hill Gravel M Co	California	3	25	Sept 3	Oct 20	Nov 12	H Peckam	220 Sansome st
Silver Hill M Co	Nevada	19	05	Sept 3	Oct 8	Oct 30	W E Dean	309 Montgomery st
Trinity M M Co	California	1		Sept 15	Oct 22	Nov 6	L Wadham	528 California st
Tip Top M Co	Arizona	7	25	Aug 16	Sept 24	Oct 22	H Deus	309 Montgomery st
Union Con M Co	Nevada	24	50	Oct 15	Nov 20	Dec 11	J M Barrington	309 California st
Utah S M Co	Nevada	46	1.00	Oct 11	Nov 16	Dec 3	G C Pratt	309 Montgomery st
Winthrop M Co	California	2	25	Sept 17	Oct 25	Nov 16	H Wright	327 Pine st
Yaqui M Co	Mexico	2	10	Sept 12	Oct 17	Nov 7	T T Atkinson	337 Pine st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	Annual	Oct 22
Commonwealth M Co		P F Mohrhardt	311 Montgomery st	Annual	Oct 24
Chicago S M Co	California	F Hutton	431 California st	Annual	Oct 23
Gold Lead M Co	California	J Bronza	328 Montgomery st	Annual	Nov 2
Happy Valley M Co	California	D M Kent	330 Pine st	Annual	Oct 24
Lima Con M Co	California	C T Johns	309 Montgomery st	Annual	Oct 25
Oakland Q M Co	California	P Jacobus	309 Montgomery st	Annual	Oct 25
Silver Lick Con M Co	Nevada	J O'Farrell	420 California st	Annual	Oct 22
Trinity G M Co	California	L Wadham	528 California st	Annual	Nov 5

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Bulwer Con M Co	California	W Willis	309 Montgomery st	15	July 2
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	July 19
Mt Diablo M Co	Nevada	R W Heath	318 Pine st	25	Oct 25
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	Oct 12
Silver King M Co	Arizona	J Nash	315 California st	25	July 12

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Sept. 26.		WEEK ENDING Oct. 3.		WEEK ENDING Oct. 10.		WEEK ENDING Oct. 17.	
Alpha	2.00	2.30	....	2 25	....	2.25	2.10	2.50
Alta	1.60	1.60	1.25	1.60	1.30	1.40	1.40	1.60
Andes	.50	.70	.50	.55	.55	.60	.55	.60
Albion	....	.45	....	....	.35	.40	....	....
Argenta	....	....	....	....	.20	.25	.15	.40
Atlas	....	....	....	....	....	....	....	....
Belcher	1.00	1.05	1.05	1.10	1.15	1.35	1.20	1.45
Belding	....	....	....	....	....	....	....	....
Best & Belcher	3.20	3.60	3.05	3.20	3.15	3.30	3.10	3.90
Bullion	....	.85	.75	.80	....	.85	.80	1.00
Bechtel	....	....	....	....	....	....	....	....
Belle Isle	....	.30	....	.30	....	.40	....	.50
Bodie Con	.55	.60	.50	.60	.50	.55	.40	.70
Benton	.25	.30	.20	.25	....	....	.20	.25
Bodie Tunnel	....	....	....	....	....	....	....	....
Caledonia	....	.25	....	....	....	....	....	....
California	....	.15	.10	.15	.15	.20	.15	.20
Challenge	....	.35	....	.35	....	....	....	.35
Chollar	2.70	3.05	2.25	2.80	2.65	2.95	2.20	3.00
Confidence	1.60	1.80	....	1.60	1.85	1.90	....	....
Con. Imperial	....	....	....	....	....	.10	....	.10
Con. Virginia	.45	.55	.40	.45	.45	.50	.50	.60
Crown Point	1.10	1.20	1.10	1.30	1.30	1.45	1.20	1.40
Day	....	....	....	....	.20	.35	....	....
Elko Con	....	....	.10	....	.15	....	.10	....
Eureka Con	....	5.75	6.25	7.00	5⅝	6.00	4.50	5.00
Eureka Tunnel	....	....	....	....	.10	....	.10	.15
Exchequer	.55	.65	.50	.60	.55	.65	.50	.65
Grand Prize	.15	.20	....	.20	.25	.60	.50	.55
Gould & Curry	2.20	2.60	2.25	2 35	2.20	2.40	2.10	2.35
Hale & Norcross	3.55	4.10	3.25	3.70	3.50	4.00	2.25	3.85
Holmes	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	....	....	....	....	....	....	....	.05
Justice	.40	.55	.40	.55	.50	.45	.40	.45
Jackson	....	....	....	....	....	....	....	....
Kentuck	....	....	....	....	....	....	....	....
Martin White	....	.10	....	....	....	....	....	....
Mono	....	....	....	....	....	....	....	....
Mexican	2.25	2.75	2.15	2.35	2.25	2.50	2.25	2.70
Mt. Diablo	4.25	4.75	....	....	....	.25	4.00	4.50
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	....	....	....	....	....	....	....	....
Northern Belle	....	6.00	5.75	5⅝	....	5.00	5.00	5⅛
North Noonday	....	....	....	....	....	....	....	....
Navajo	....	.60	....	2.60	2.70	3⅜	3.25	4.50
North Belle Isle	....	.45	....	....	.40	.50	.40	.70
Occidental	....	....	....	....	....	1.50	1.50	1.60
Ophir	3.25	3.70	3.25	3.45	3.60	4.70	4.55	6.75
Overman	....	.40	....	.35	.35	.40	....	.40
Ore	....	....	....	....	....	....	....	....
Potosi	1.00	1.15	.85	1.05	.95	1.15	.90	1.15
Pinal Con	....	....	....	....	....	....	....	....
Savage	1.65	2.00	1.40	1.70	1.45	1.55	1.10	1.50
Scg. Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	3.60	4.35	3.40	3.70	3.95	4.35	4.15	4.60
Silver Hill	....	....	....	....	....	....	....	....
Silver King	....	7.50	....	7.25	....	....	....	....
Scorpion	.60	.65	.50	.60	.55	.60	.60	.65
Tuscarora	....	....	....	....	....	....	....	....
Union Con	4.25	5.85	3.80	4.00	3.80	4.40	3.85	4.20
Utah	1.70	2.20	1.80	2.40	1.90	2.10	1.90	2.40
Ward	....	....	....	....	....	....	....	....
Wales	....	....	....	....	....	....	....	....
Yellow Jacket	3.05	3.25	3.05	3.20	3.20	3.65	3.25	4.00

Sales at San Francisco Stock Exchange

THURSD'Y A. M., Oct. 18.		AFTERNOON SESSION.	
270 Alta	1.50	100 Alta	2⅛@1.60
25 Andes	60c	3410 B. & Belcher	3⅜@3.90
250 Bodie Con	65c	800 Belle Isle	50c
640 B. & Belcher	3.45@3⅜	150 Bodie Con	70c
500 Bullion	1	200 Belcher	1.40
750 Belle Isle	50c	1550 Chollar	2.65@2.70
1100 Chollar	2.40	2400 California	20c
50 Crown Point	1.35	2200 Con. Virginia	55@60c
200 Exchequer	55c	200 Crown Point	1.35@1.40
10 Eureka Con	4.70	90 Eureka Con	4.60
230 Gould & Curry	2.30@2 35	1170 Gould & Curry	2.45@2 50
200 Grand Prize	55c	200 Grand Prize	55c
1350 Hale & Nor	2.40@2⅜	2405 Hale & Nor	2.80@2.85
220 Justice	40c	400 Julia	05c
500 Mexican	3.30	550 Justice	40@45c
75 Navajo	4.60	1030 Mexican	2.45@2⅛
700 N. Belle Is	70c	250 Navajo	4.45@4½
100 Ophir	5⅜	200 N. Belle Is	70c
805 Potosi	1	390 Ophir	5⅝@6
550 Savage	1.15	100 Overman	40c
405 Sierra Nevada	4.20@4½	1 0 Potosi	1.05
100 Scopion	60c	150 Scorpion	65c
150 Utah	1.85@2	200 Savage	1⅛
255 Union	3.85@3.95	660 Sierra Nevada	4½@4.60
50 Yellow Jacket	3⅜	145 Utah	2.40
		1230 Union Con	4.10@4.20

THE Humanitarian Invention Association of Youngstown, O., has offered a premium of $3,000 for the best and most practicable invalid chair for the use in homes, hospitals, and public conveyances. An exchange says this premium ought to be won by some bright woman with inventive faculties and a practical experience in the sick room.

Mining Share Market.

Aside from the fluctuations which our stock tables show, there is little to record of the mining share market. In fact, stocks have very little animation in these days, and attract comparatively little attention from the public. No doubt, however, should rich ore be struck at any important point in the Comstock, there would be a revival of interest.

The showing in the joint Union Con. winze is said to be good, as is that at the north end of the Sierra Nevada.

The station for the new hydraulic pump at the Chollar-Norcross-Savage shaft is about completed, and they are now ready to set up the machinery as soon as it arrives.

The Mexican will now very soon connect the raise rom the 2900 with the winze down from the 2700 evel. Active prospecting will then be in order.

At the Imperial, a working station is being cut out at the 600 level. From this a drift will soon be started west. All the ground is virgin from the surface down to the 900 level, (has never been passed through by a drift) until the workings of the old mine (well out west) are reached, therefore there is a chance of finding a front ledge of some kind.

At the Gold Hill mines some work is being done at present, but a full force of miners will not be put on until the mills can take the ore.

Excellent headway is making in draining the Alta. The time is not now far distant when the miners will again be at work in the lower levels.

Bullion Shipments.

Ontario, Oct. 10th, $5,086; Horn Silver, 10th, $12,000; Vienna, 10th, $2,596; Hanauer, 11th, $8,520; Alice, 11th, $23,024; Ontario, 11th, $5,052; Alice, 12th, $16,293; Ontario, 12th, $5,407; Horn Silver, 12th, $12,000; Vienna, 12th, $2,864; Belleville, 12th, $1,993; Hanauer, 13th, $5,545; Horn Silver, 13th, $12,000; Ontario, 13th, $5,367; Stormont, 14th, $3,465; Hanauer, 14th, $2,483; Alhambra, 1st, $3,167; Mt. Diablo, 8th, $7,327; Bodie, 15th, $10,190; Northern Belle, 15th, $6,658; Contention Con, 13th, $15,523; During the week ending Oct. 13th, there were shipped from Salt Lake 45 cars of bullion, 1,183,044 pounds, sent East; 13 cars of ore, 376,170 pounds, sent West; 1 car of ore, 24,440 pounds, sent East, and 1 car white lead, 24,900 pounds, sent West, making a total of 61 cars, aggregating 1,608,554 pounds.

MODEL VETERINARY SCHOOL.—The Berlin Veterinary School was attended last winter by 247 matriculated students, the largest attendance during the century of its existence. The main building, with its three leeture halls, its large, well stocked library, and numerous lodgings for officials, etc., contains also an extensive anatomical department, with very valuable collections. The pathologieo-physiological institute connected with the establishment is situated in one of the new wings. The dog hospital, the horse hospital, the operating rooms, riding school, smithy, etc., are considered the best of their kind. In the cow stables are to be found the favorite races of all countries, partly for purposes of instruction, partly for the use of the dairy. The horse hospital can accommodate 100 sick horses. In it there were treated in 1882 no fewer than 2,241 animals; 600 were examined and dismissed; 7,085 sent to the polyclinic. In the stationary dog hospital 1,200 patients were treated; in the polyclinic, 3,215.

IT is stated that the Mexican Government has negotiated a loan of $10,000,000 with Americans and Germans, the bonds to be taken at eighty-four cents on the dollar, bearing nine per cent interest.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

A NEW STRIKE.—*Ledger*, Oct. 13: A strike which promises to be of much importance was made at Middle Bar last week, on the Wetzler claim, which joins the Mammoth on the south. The mine has recently been bonded for one year. We have seen samples of the ore. It is very similar in appearance to the rich ore met with in the Mammoth. It is decomposed quartz, carrying a heavy percentage of free gold. The value of this discovery cannot be ascertained at present, but it is not improbable that another rich deposit of gold has been stumbled upon.

Calaveras.

EMPIRE.—*Chronicle*, Oct. 13: The Empire gravel mine, in Old Woman's Gulch, run by the Cook Bros., is showing up well. The batteries of the mill were cleaned up the other day, after a six days, run, and the yield was over $600. The expense of getting out the gravel and milling it was $180, leaving a clear balance of $420. Ten men altogether are employed.

LEAVITT.—We were shown during the week some very rich quartz specimens from the Leavitt. This mine is near the Mokelumne River, a mile and a half from this place. The rock, which was taken from near the top of the lead, carried plenty of free gold. Considerable work in the way of prospecting the lead has been done of late.

CARSONS.—*Mountain Echo*, Oct. 11: The old and dilapidated town of Carsons is on the eve of a mining boom. A new forty-stamp mill has recently been completed on the Reserve mine, and is the finest mill ever erected in this county. William Irvine, Supt. of the Morgan, is building a mill, which will start with ten stamps but have a capacity for ten more if required.

El Dorado.

CANYON CREEK.—Georgetown *Gazette*, Oct. 12: It is rumored that a movement is being made towards the consolidation of all the leading seam-mines at Georgia Slide and the Canyon Creek mining property. As it now is, although the mines are paying very well, they are being worked under great disadvantage, on account of depth. All who are acquainted with these mines are satisfied that in connection with the Canyon Creek property no better investment can be found. The old Parsons mine alone would pay handsomely upon a tunnel from Canyon Creek.

ANOTHER SEAM.—Bill Lane has a seam-mine down in the bonanza neighborhood, a mile south of town, which is showing good prospects. He has two men at work sinking.

VOLCANOVILLE.—R. G. Hart, formerly manager of the Josephine quartz mine at Volcanoville, has purchased the Flora gravel mine, near that place, which he has been working for the past six weeks, with a force of 10 men. We learn that the force is to be immediately increased to 25 men. The mine is worked by drifting. The gravel deposit is immense.

MELTON.—Placerville *Republican*, Oct. 11: Since the return of Supt. McClellan, of the Melton mine, at Grizzly Flat, from the East, the mine has been running full-handed, and work is being pushed.

Inyo.

ELGIN.—*Independent*, Oct. 6: Baker, Keys & Barnes, of the Elgin mine, Beveridge district, last week cleaned up a short run of their arastra. Eight tons of ore yielded 40 ounces of gold, worth at the mint $16.75 per ounce. They will on Monday begin the construction of a trail to the McEvoy mill, and purposes hereafter to keep that institution running on $70 free-gold ore.

BULLION SHIPMENT.—Hupert Farians made a clean-up the other day at the Lasky mill, Beveridge district, by which he obtained 136 ounces of gold, valued at $2,100. This was the yield of 75 tons of ore.

BEVERIDGE DISTRICT.—Topographically, Beveridge district is the roughest in the state. Nevertheless, its output of gold bullion has been constant for years, first as that produced by a number of arastras, then of a 5-stamp mill, now of 2 such mills and a steam arastra.

BENTON.—The Eureka mill at Montgomery has been running steadily; also the Diana. At the Indian Queen, the 1600 ft tunnel is nearing the end. There is considerable deep prospecting going on all around. The mines and mill at Clover Patch will soon be "booming" again.

THE NEW FURNACES. In answer to inquires we can say that the indications are that both will fire up inside of 3 weeks. Ore from Cerro Gordo, and all needed supplies, are on hand and being received at the Swansea furnace, sufficient for quite a run.

ORE SALE.—Ten tons of silver ore from the Indiana mine, Swansea district, of the assay value of $4,600, were recently sold in San Francisco, for $3,200 net. Daniel Meyer & Co. were the purchasers, and the ore is to go to Europe for reduction.

Mariposa.

COULTERVILLE.—Cor. of *Herald*, Oct. 12: The Virginia or Coe mine will resume work in a short time, and the Cook mines have a prospect of starting work again. At the Red Cloud, the workmen have the machinery all in place. They are soon to commence crushing ore from the Red Cloud vein, which is very rich. The mode of reduction and amalgamation is new. Mr. Reardon, the Supt. and inventor of the amalgamator, is sanguine. The Banderita and Compromise are both running full-handed. The Shimer mine will be started up soon.

CANNON MINE.—This mine, situated near the Diltz, was worked by Mexicans in 1851. They used arastras, and a tradition is that a large amount of gold was extracted, and the Mexicans left it through fear of Indians. Preparations for opening up this mine have been made by Captain Diltz. The work of sinking a new shaft will be commenced immediately. Rich specimens have been found upon the old dump used by the Mexicans. The vein matter between the walls is fifteen feet thick, and shows a solid vein four ft wide.

Mono.

MAY LUNDY.—Homer *Index*, Oct. 13: No material change in the upper workings of May Lundy, but all the stopes are looking well. The lower levels show marked improvement. Fifteen feet below the floor of the lower or main tunnel an ore vein 3½ ft in width was unexpectedly encountered during the week, coming in from the southeast. An upraise has been started to tap this vein from the 90-ft level of the winze.

LAKE VIEW.—The incline sbaft following down the west ledge in Lake View is down 20 ft, and ore is being taken out to the southward, the breast carrying 2 ft of clean milling ore of high grade. The ore vein in the bottom of the shaft is 2½ ft wide. The incline shaft in the lower or easterly vein is down 25 ft, and carries 3 ft of good ore.

JACKSON.—The tunnel in the Jackson was advanced 10 ft during the week; total length, 125 ft. The course of the adit has been changed so as to follow the vein which recently came in from the south. In the present face this vein carries 12 in of very rich ore, and is steadily increasing in size and strength.

GORILLA.—The Gorilla mine and reduction works are crowded. Two feet of very rich ore is being followed by a drift from the winze at a point 120 ft from the surface and 300 ft above the lower tunnel.

STANDARD CON.—Bodie *Free Press*, Oct. 9: During the past week there were 1090 tons of ore sent to the mills. The bullion shipment amounted to $33,555.90. The east cross-cut, 1200-ft level, is in 580 ft; progress, 15 ft.

BODIE CON.—During the week 140.615 tons were sent to the mill, and 147 tons were crushed. The average assay value of the pulp was $34.66 per ton. The tailings was valued at $5.88. The bullion shipment was valued at $10,199.54.

Nevada.

EMPIRE.—Grass Valley *Transcript*, Oct. 10: The new mill of the Empire mine is nearly complete; about 2 weeks will find it perfect. The beavy timbers that support the batteries are being put in place, and all of the old timbers, inside of the mill are being replaced by new ones. The new self-feeders bave arrived. A "Triumph" concentrator is at work in the mill. In all probability the Empire Co. will adopt the Triumph. The mine is looking well underground, and the company are sinking for the purpose of opening up a 1400 level.

MT. AUBURN.—*Transcript*, Oct. 14: The Mt. Auburn mine is now being worked full-handed. Marked improvements have taken place in the appearance of the ledge within a few days. The Mt. Auburn has never looked so well as it now does.

PEABODY.—Grass Valley *Union*, Oct. 13: Work in the Peabody mine is now going on regularly. The drift in the first level below the drain tunnel has been extended 30 ft in a northwestly direction. The ledge is showing to the width of 9 inches. The new prospect shaft which is being sunk on the old Eureka ground has reached a depth of 90 ft, from which some good quartz has been taken.

Plumas.

CROMBERG.—Quincy *National*, Oct. 13: Paul Willet has discovered a rich quartz ledge a mile from Poplar Valley. He took out one mass of quartz that yielded $300 when crushed. I hear that some Pittsburgh men are going to take hold of the mine. The Consignee mine is running along all right. The large reservoir of Tefft & Evans is being pushed along as fast as possible. Mr. Bennett, brother of T. D. Bennett, of Mohawk, is running a prospect tunnel half a mile east of the Jackson claim. He has gone over 200 ft through solid bed rock, and thinks he will strike the channel by the 1st of Dec.

RICH GULCH.—Greenville *Bulletin*, Oct. 10: Angus Cameron reports the prospect over at Rich Gulch to be first-rate. The ledge in which Halstead and others are interested is 30 ft wide, and specimens of ore taken from it are immensely rich. By next spring there will be a big mining boom on that part of the river, and mines will be opened that will rival in richness the Eagle Gulch or Four Hills mines.

EMERALD MINES.—These are three ledges, owned by a corporation, of which Hardgrave is Pres. The most important is No. 2. This is a fine ledge, standing nearly vertical, with well defined walls, and bids fair to create a boom for Plumas. The extent of the pay chimney is not known, but it has been sufficiently developed to justify the building of a ten-stamp mill, there being an abundance of water for milling purposes.

San Diego.

SHENANDOAH.—National City *Record*, Oct. 11: While in San Diego, Saturday, we had an opportunity to examine some of the rich gold-bearing quartz from the Shenandoah mine of Mesa Grande. These specimens have been examined by experts and pronounced good for $1,000 a ton. They are now at the depth of 140 ft, and the ledge, which grows richer, has an average width of 2 ft.

Shasta.

IGO.—Cor. *Courier*, Oct. 13: Our town has been visited of late by a good many mining experts, looking for mines to invest in. All the arastras on South Fork are now running and yielding metal. The Hardscrabble mine will start up as soon as there is sufficient water to run the same.

Sierra.

RUBY.—Sierra *Tribune*, Oct. 11: H. Fowler was down from the Ruby mine Monday, and gave us the particulars of the recent rich strike. After running the main tunnel 112 ft north, across the channel, a winze was sunk and gravel encountered at a depth of 4 ft. Ten carloads of dirt were washed that yielded 1¾ ounces of gold, or $3 per load. Another lot of 17 carloads of gravel was then washed, and paid $7 per load. Another winze was sunk 50 ft further south on the channel, and 12 carloads of gravel taken out that yielded $3 per load. An incline has been started on the channel.

COLUMBO.—The company opening the Columbo mine, at Sierra City, are driving ahead as rapidly as it can be done with one hundred men. The mill has been shipped and will arrive soon.

SIERRA BUTTES.—The result of the working for the month of August was as follows: Total receipts, $20,182; total working expenses, $13,303; in addition to which $2,350 was spent on the ninth level, and $4,750 on the new mill.

KANAKA CREEK.—On Kanaka Creek, Fessler & Co., owners of the Bullion claim, are driving ahead their lower tunnel. In a short distance further the

vein will be tapped, when important developments are looked for. There is a fine ten-stamp mill on this property.

BUCKEYE.—The Buckeye gravel mine, at Allegheny, owned by Patton, Hucklebug & Bernhart, continues to yield handsome dividends. A fine lot of course gold was shown a *Tribune* reporter, the result of a recent clean-up.

San Bernardino.

ORO GRANDE.—*Index*, Oct. 13: Five bars of bullion arrived yesterday from Oro Grande, valued at $8,000. The Silver King is turning out an immense lot of rich ore from its lowest levels. About 30 tons of ore are crushed each day at the mill.

STRIKE IN CALICO.—*Print*, Oct. 13: A rich strike was made a few days ago in the edge of town back of the Pioneer House. A wagon road was being built, when a vein was struck, which proved to contain very rich ore. Some parties interested proceeded to dig down to ascertain the extent of the deposit. The indications are good that a rich lead may be developed.

Trinity.

GETTING READY.—*Journal*, Oct. 13: From all sections of the county we hear that miners are preparing their claims for winter work. There appears to be an almost unanimous opinion that the coming season is to be a wet one—plenty of snow, rain and high water; in fact, just such a season as we need in our business at this time. It has been several years since we have been favored with a good mining season.

BULLYHOOP.—From E. Cornell, who visited this mine a few days ago, we learned that the shaft is down 76 ft, that the ledge is 4 ft wide and contains a great deal of very rich rock. He brought us in a piece which shows considerable free gold.

STUYL.—The owners of this mine, Deadwood district, intend erecting a mill, there being a large lot of good milling ore in sight.

NEVADA.

Washoe District.

UNION CON.—*Enterprise*, Oct. 13: The joint Sierra Nevada winze below the 3000 level is nearly down to the 3100. The quartz and ore grow stronger as depth is attained. The ore is almost wholly gold-bearing. It is a pure white quartz, in specimens of which free gold is visible to the naked eye.

MEXICAN.—Are now running a drift from the top of the raise from the 2900 to connect it with the winze down from the 2700 level. The main north drift on the 3100 level is still in favorable ground.

YELLOW JACKET.—Considerable paying ore is found in running prospecting drifts on the Sagebrush level. The regular extraction of ore has not yet been resumed. The Brunswick mill, on the Carson, will soon be ready to start up with steam power, in case there should not be sufficient water in the river.

SAVAGE.—On the 2600 level, at the south line, a west cross-cut was run out 48 ft in quartz giving low assays—from a trace up to $4 or $5.

HALE AND NORCROSS.—The south drift (which is on a curve and will have the effect of a cross-cut, as also is the case in the north drift) is out about 40 ft. It has passed through an outlying stringer that gives good assays.

SIERRA NEVADA. The main north drift on the 2900 level is being rapidly advanced. It has about 50 ft to go to reach the point where a raise will be started to connect with the winze down from the 2700 level.

GOULD AND CURRY.—The east drift on the 2500 level is being pushed ahead at the rate of 50 ft per week in hard porphyry.

ANTES.—Some ore of fair quality is being extracted from the drift north along the west wall. The north and south drifts from the 75-ft station of the winze are passing through favorable material.

COMBINATION SHAFT.—The station for the new hydraulic pump is about completed. It is 80 ft long, 30 ft wide and 15 ft high, and is timbered wholly with spruce.

ALTA.—The water is being rapidly reduced. Changes are about to be made in the pumps from the Sutro tunnel level down to the 1850 level, which will increase their capacity.

CROWN POINT.—Work is gradually being resumed in the lower levels. As soon as the mills can crush the ore a full force of miners will be put to work.

OPHIR.—On the 150 level some old filling is found that will pay for milling.

IMPERIAL.—The main shaft has been put in good repair down to the 600 level, at which point a station is being cut.

CALIFORNIA.—Since setting up the hoisting engine, more rapid progress has been made in sinking joint Con. Virginia winze No. 2.

CON. VIRGINIA.—More rapid progress has been made in sinking joint California winze No. 2 since the setting up of the hoisting engine.

UTAH.—The north drift on the 1350 level is being pushed ahead at the rate of 30 ft per week.

SCORPION.—The west drift on the 500 level is still being advanced in ground of a favorable character.

OVERMAN.—Are extracting some very good ore from the old upper levels.

UNION SHAFT.—Are still engaged in easing timbers at the 2300 station.

BELCHER.—Are preparing to resume the extraction of ore.

THE DEEP WINZE.—*Enterprise*, Oct. 10: Twelve apostles of the science of mining yesterday visited and inspected the development at the bottom of the Union-Sierra-Nevada winze, now about down to the 3100 level. The visitors were fiearly all well pleased. The quartz runs high in gold, and it is said that free gold was seen in some samples. There has certainly been a great change for the better between the 3000 and 3100 levels. It is a fine prospect, and a cross-cut to the west on the 3100 level will soon show the extent, character and richness of the deposit,

The Virginia *Chronicle* says this winze is the deepest point in the earth where gold has been found. The impression has generally prevailed on this coast that silver only is met with at so great a depth, but the fact of native gold being visible in the quartz found at a depth of 3100 ft, scatters all such theories to the wind. A sample of ore was taken by Captain John Kelly from the Union deep winze last Tuesday, assaying $1,100 in gold and a small proportion of silver. The sample was not selected, but was taken from the sackful of ore brought out by Captain Kelly.

Candelaria District.

NORTHERN BELLE.—*True Fissure*, Oct. 13: The upraise above the southwest drift on the fifth shaft level has been timbered during the week, and a small quantity of very good sulphurets obtained. A drift has been started to the east from the main cross-cut on the same shaft level, and has been extended 10 ft. The new cross-cut to the south on the fourth shaft level, has been extended 11 ft, making its total length 42 ft. The ore is of very good grade in the new development above the seventh level, and shows indications of permanence. About 24 tons of ore are being shipped to the mill daily, and both mills are running as usual. A shipment of bullion amounting to $5,149.73 was made on the 8th instant.

COLUMBUS CON.—The work of sinking the Bonanza winze was discontinued a few days ago, and drifting to the west has been commenced. The face of the west drift is streaky and full of lively quartz and bunches of good ore. In the face of the east drift is a narrow streak of mineral-bearing material, which gives low assays,

MOUNT DIABLO. A small amount of ore is being extracted from the drift below the stope from lower winze No. 2. The stope from this winze is yielding considerable $60 ore. The stope below the third level, near the head of winze No. 2, is turning out some $70 ore. The stope near winze No. 1, below the third level, shows a strong bunch of $50 ore. A shipment of bullion was made on the 8th instant, valued at $7,327.14.

Belmont District.

BELMONT MINE.—*Courier*, Oct. 6: Official report of Supt. is as follows: Shaft No. 1 in Laity ground is down 30 ft below first level, showing good ore throughout. First level going south is now 133 ft south of Highbridge shaft, all in ore. The gangue is filled with quartz showing some ore. From winze No. 1, south tunnel, we are raising fine ore. All stopes are producing well. Mill work is progressing finely. We are hauling ore to the mill.

Eureka District.

BAY STATE.—*Sentinal*, Oct. 12: Mr. Daley, foreman of the Bay State mine, told a *Sentinal* reporter on Wednesday that 800 tons of ore had been shipped from the dump and 800 tons more would be shipped to Eureka for reduction. This is ore that was extracted some time ago, and pays for shipment now on account of cheaper rates of freight. It is packed on mules 3 miles to the summit, and hauled thence to Eureka.

SILVERADO.—The tributers at Silverado are doing exceedingly well. New discoveries are made daily, and the ore is so rich that every pound counts. Finn & Sullivan have just made a shipment of 3 tons of ore which worked nearly $300 per ton. The Berrymans are taking out $250 ore from the 400 level of the Rescue mine. Steve Bedell has just made a shipment of $400 ore from his pitch in the Quinn mine, and Pumphrey is sacking bullion from a 10-inch vein in the same mine. Bill Long and Jim Smith are starting in on the "Silver Stone" with a splendid 3-ft vein of rich ore in sight and some 50 tons of good pay rock on the dump.

EUREKA CON.—Within a few months, "Old Reliable" may gladden the public by a resumption of dividends. Every thing about the mine is encouraging for the future, and with the water once under control the company will have rid itself of all drawbacks, and those who now grumble will be made to smile.

Pioche District.

NOTES.—*Record*, Oct. 6: The ore in the Kingfisher mine, having been fairly tested during the week, shows an average of 40 per cent lead and $49 silver. The boys of Poverty Gulch, Comet district, are again shipping rich ore to town and selling it to J. Poujade. The tailing mill, which has been closed down for the purpose of putting in new pan-bottoms, started up Friday. H. H. Chandler is in charge of the mills of both the Christy and Barbee companies at Silver Reef.

Railroad District.

BULLION.—Elks *Free Press*, Oct. 12: C. C. Warner & Co. shipped two cars of bullion, 576 bars, weighing 56,015 pounds, to the Bank of California, San Francisco, since the furnace started up at Railroad, and will ship to-night 266 bars, weighing 26,175 pounds, to the same bank. The furnace has only been running a little over a week.

Tuscarora District.

INDEPENDENCE.—*Times-Review*, Oct. 11: The upraise on the 400 level has been carried up 10 ft the past week, and timbered. Total height, 87 ft. A cross-cut has been started east to connect with the 300 level, and is out 14 ft. Drift north on the 300 level has been advanced 11 ft—total length 845 ft.

GRAND PRIZE.—West drift on the 200 level is in 46 ft. Good sized ledge. Raise above the 300 is up 90 ft; the ledge is irregular; the ore is good. West drift on the 400 is in 47 ft. Some low-grade ore in face of drift.

NORTH BELLE ISLE.—North Belle Isle south drift, 300 level, has been advanced 28 ft. The stopes are producing the usual ore.

ELKO CON.—Since last report, shaft No. 2 has been extended 11 ft. Total depth, 155 ft. There is no material change.

ARGENTA.—North cross-cut on the 400 level is in 128 ft; progress for the week, 11 ft.

BELLE ISLE AND NAVAJO.—Work progressing as usual.

ARIZONA.

GROOM CREEK.—Prescott *Courier*, Oct. 6: Groom Creek is the coming district. It is six miles south of Prescott, in the pine forest, has a great many ledges which carry gold and silver in paying quantities, and is easy of access.

BULLION.—Wagons laden with 20,000 pounds of silver bullion started from the Howell smelter yesterday. Bullion goes to Chicago.

MAMMOTH.—The owners of the Mammoth have incorporated and now propose to open the biggest mine in Arizona. A lot of ore from the Oro Bonito West, Bradshaw district, was brought here yesterday, by its owner, Mr. Able. Its sulphurets are rich in gold.

NOTES.—Prescott *Courier*, Oct. 10: The Dosoris Co. have shipped 55 tons of their richt ore to Pueblo. They expect it will yield $500 to the ton. Twenty-five men are employed. The Peck Co.'s mill is running. Forty-five men are employed. Black Warrior mill is running steadily. Alters & Co. have 6½ tons of good silver ore sacked. It will be shipped to Pueblo. Thirty thousand pounds of bullion were shipped to Chicago Saturday last by the Howell Co. Clark, Supt. of the Arizona Queen Co., has fourteen men at work in the Chicago mine, Groom creek district. Men work eight-hour shifts. The steam hoist is kept busy bringing up water and rock; the latter is rich in free gold. Saulsburry & Co., owners of the Benson smelter, think they will make big money by working the Vulture tailings at Wickenburg.

COLORADO.

BUCKHORN.—*Register-Call*, Oct. 5: One of the most wonderful mineral discoveries on record was made in the Buckhorn mine on Crystal hill, Saguache county, last week. In developing that mine caves were discovered varying from a foot to several feet in diameter, possessing walls of rich mineral. The writer is informed that Senator T. M. Bowen offered Captain Burrows $85,000 in cash for his interest in the camp. Captain Burrows owns one-fourth interest in the Buckhorn. The offer was refused. The Buckhorn has over $200,000 worth of ore on the dump. It is undoubtedly the greatest mine in Colorado.

GOLD BULLION.—Mr. W. J. Lewis brought from the California stamp mill yesterday afternoon 25 pounds 300 ounces—gold bullion, the yield of 70 stamps for one week's running on mill ore from the California mine on Quartz hill. The west 1400 level is turning out mill dirt that averages 10 ounces gold per cord.

ST. JOHN ORE.—A lot consisting of about 1800 pounds of ore from the Gov. St. John mine was sampled at the works on Monday, and gave 115 ounces of silver per ton. The ore was an average of from 15 to 20 tons now on the dump. The St. John will be one of the way-up bonanzas of the camp. At present the ore has to be packed down on jacks, at a cost of $8 per ton.

IDAHO.

ATLANTA.—Ketchum *Keystone*, Oct. 6: The Last Chance mine, known as the "specimen mine," to-day looks better than ever. It is estimated that 2,000 tons of good ore are on the dump, and 500 ft of a solid shoot in sight in the mine. This will be sufficient to run the mill, for 10 years to come, at the rate of 20 tons daily. The ore now worked, though considered as gold ore, carries large quantities of silver. The assay value in gold is an average of $125. The tailings are concentrated. The sulphuret ore assays $300 per ton in silver. The monthly output of the mill is $17,000, and the cost of operation is estimated at $3,400. A brick was recently shipped via Rocky Bar that weighed $5,300 in gold.

MINING SALE.—The Independence and Silver Bullion group of claims, a mile east of the Elkhorn, have been leased to J. M. Reid & Co., who will work the property during the winter and extract ore for reduction at the Philadelphia smelters. The ore is bright galena and carbonates. There are at present on the dump 5 tons that samples 250 ounces in silver per ton. A two-thirds interest in this group was sold out two months since for $250.

DAVITT AND SILVER KING.—Wood River *Times*, Oct. 3: Mr. Scott, of the Davitt and Silver King mines, expresses himself entirely satisfied with his investments. The Davitt, which he bought last February, has yield $45,000 since the end of last April. Within three weeks a new shaft was started on a vein entirely distinct from the Davitt. This shaft is down 50 ft, in ore all the way, which shows widest at the bottom. This new vein can be traced on the surface for 800 ft. The Silver King mine, which he and his associates took hold of about 50 days ago, and upon which they have worked an average of 15 men, has yielded about $40,000.

LOST RIVER.—L. M. Schroeder got in to-day from Corning Canyon, Lost River, bringing with him a 25-pound chunk of ore from a group of 7 mines which he owns there. This chunk is fully 1 ft wide, averages over 50 ounces to the ton, and carries a streak 3 inches wide that goes over 400 ounces. The vein is 2½ ft wide, milling ore. The incline shaft on the Iron King, where the ore is found, is down 20 ft, and the vein well defined.

WHALE.—Challis *Messenger*, Oct. 2: The three smaller veins are combined as depth is attained, and the ore body is now about 4 ft wide, and of a grade that is very easy for a company of miners to bear—$450 per ton, by the mill. This is, without a doubt, one of the great mines of the earth. On the whole, this Yankee Fork country is ripe for success.

MONTANA.

BULLION.—Butte *Miner*, Oct. 3: During the week the shipments through the Pacific Express office were 48 bars, valued at $86,440, which is credited as follows: Alice, 24 bars, valued at $36,528: Donnell, Clark & Larabie, 11 bars, $14,024; Lexington, 13 bars, $25,888.

SHONBAR.—The Co. have 1,500 tons of second-grade ore on the dump, sampling 50 ozs. per ton, besides having taken out and sold ores exceeding $70,000 in value, all of which has been expended in developing the property and putting in machinery. The main shaft is down 310 feet. At the 180-level an east drift has been driven 250 ft; at the 220, another east drift has been driven 300 feet, and an east drift is now being pushed rapidly forward at the 300-foot level. Every level, stope and drift is in good pay.

MOULTON.—Connection was made last week between the winze from the 300 southwest drift and the 400 southwest drift. Stoping has been commenced at the intersection, at which point the vein is four feet wide, and assays 40 ounces. The stopes of the 200 and 300 west drifts continue to produce their usual quota of ore. At the mill, the orehouse is full and the 40 stamps steadily dropping.

A COPPER BONANZA.—Helena *Independent*, Oct. 4: The mines are 130 miles west of Fort Calgary, on the Bow River, and close to the line of the Canadian Pacific railway. They are on what is called the Joe Healy lode, and are exceedingly rich, much of the ore taken out this summer carrying over 80 per cent in copper, besides a paying quantity of silver. The vein is a very strong one, and has been traced for several miles. Its exact width has not been determined, but it has been crosscut from the foot wall 6 to 12 ft, with no signs of the hanging wall, and all the way in solid ore. Judging from surface indications, the vein must be over 100 feet wide, and the ore so far taken out is all free-milling. Mr. O'Connell, one of the locators, says that at places along the lode, which has been taken up for 6 miles, pieces of almost pure copper may be found upon the surface. Capt. Retallic and Prof. Kinahan, who have started upon their return to England, took with them several of these specimens, and also an 80-pound specimen, called "The Baby," which both pronounce the finest and richest specimen they ever saw.

NEW MEXICO.

NOTES FROM KINGSTON.—Cor. of Deming *Tribune*, Oct. 4: The Iron King smelter site has been selected and surveyed. The Monaska is still at the front with plenty of very rich ore. The new machinery for the concentration works has been shipped, and it is now on the road from the East. A. W. Harris, Supt. of the Illinois mine, has four men at work, which force will be increased as room is made. This mine is one of the bonanzas of the district. The boiler and pumping machinery is in place, and ready for operation at the Superior mine. The Iron King Co. contemplate the letting of a contract to sink the main shaft 200 feet deeper. A large body of ore, assaying $150 per ton, was encountered last week in the Iron King. T. F. Chapman, Supt. of the Bullion, will purchase hoisting machinery for the Bullion. The Lady Franklin is producing some fine ore, similar to that of the Bullion and Superior. The Keystone mine on the North Percha is producing some fine ruby ore. The owners have started a tunnel to cut the lead at a greater depth. A double shift has been put on the Big Tree mine, one and a half miles south of town. This is a promising prospect, just opened, and is owned by Dr. Thompson, Baker, and others.

GOLDEN RULE.—Silver City *Enterprise*, Oct. 5: The Golden Rule ledge can he followed easily for 3000 feet, but is only opened for 1200, and for the entire length prospects well in gold. For the 1200 feet, the ledge averages 3 feet in width at the surface, and assays from $30 to $40 in gold. At the east-end shaft miners are cutting a station. The ledge widens down to the first level, where it is 7 feet, and the ore is richer than at the surface. As far as developed, the ledge improved in width and in richness.

STEEPLE ROCK.—The district is in the western part of Grant County, bordering on the Arizona line. The mineral belt is two miles in width, the veins being true fissures, cutting the formation for miles. It is one of the largest mineral belts in the Rocky mountain range, as the veins are plainly traceable above the surface for nearly 30 miles, and in some places are fully 125 feet in width. Nothing so extensive has ever before been discovered, either in this or Arizona Territory, and all that now remains to make Steeple Rock the heaviest producing district in the West is the investment of capital and the working of the mines on an extensive scale.

CARLISLE.—*Tribune*, Oct. 4: At the present time there is over 40,000 tons of pay ore in sight, and if it is found as expected at the 300-foot cross-cut, it will show above 100,000 tons, so that it is practically inexhaustible. The ore is about fifty per cent free. The tailings are concentrated on Duncan concentrators, and there are from 200 to 300 tons of concentrates now on hand. About fifty men are employed.

OREGON.

NOTES.—Jacksonville *Times*, Oct. 5: Supt. Ennis informs us that the Sterling mine will be ready for business again in less than 10 days. Miners are generally preparing for winter, and expecting plenty of water. Chas. E. Chappel & Co., of Star Gulch, are ready for water, having placed their mine in good condition. Isaac Skeeters, of Josephine County, is making arrangements to have a giant put on his claim on Hogue Mountain. Ross & Co. have sent specimens of ore from the Roten ledge, in Willow Springs district, below for assay, and if the report is favorable active operations will be resumed at once. It is likely that the copper mines near Waldo, Josephine County, will soon be the scene of active work. If the company to whom they are bonded do not mean business, there are plenty others who are ready to step in.

UTAH.

CAVE MINE.—Southern Utah *Times*, Oct. 6: The new strike in the Cave mine took place in the original or main drift, and 1200 ft from the entrance; the ore is evidently in large quantity, and assays just double all previous discoveries in the mines. The assay value is 50 ounces silver, 1 ounce gold, and 50 per cent galena, the ore being more properly described as gray carbonate, of extraordinary richness. The company has been shipping about 25 tons of ore per day to the Francklyn and Germania smelters.

WASHINGTON.

CŒUR D'ALENE.—Butte *Miner*, Oct. 3: The Cœur d'Alene placers, which drew stampeding parties from Bozeman and other points, all of which returned with curses for the "crank" Pritchard, seem likely to materialize into something. During the past forty-eight hours direct information has been received in this city which indicates that the placers are fully as rich as has been represented, and that men are taking out from $20 to $100 per day, gold nuggets being found worth up to $48.50. A letter has been received, inclosing one from Pat Magrath, which sets forth the richness of the new diggings in glowing terms. The richest diggings struck so far are on the Mrs. McLean claim, where, on the day before writing, a party of six men had taken out with pan and rocker $600 in dust and nuggets, one nugget being worth $48.50. The digging so far has been only two feet deep. Pritchard Creek is very flat, 25 miles long, and is located its entire length in claims of 20 acres each. There are about 150 men in the camp, and 125 more were expected to arrive from Spokane. The writer don't advise anybody to come in, unless they are well prepared to winter in the camp. The new El Dorado is reached by the Northern Pacific road via Rathdrum, Idaho, from whence it is 80 miles, over a very rough trail, to the mines.

Working Gold-Bearing Arsenical Ores.

Mr. Richard P. Rothwell, of New York, read the following paper on the treatment of gold-bearing arsenical ores at Deloro, Canada, before the American Institute of Mining Engineers, at their Colorado meeting:

The ores treated by the Canada Consolidated Gold Mining Company, at Deloro, Ontario, have been described in a paper read before the Institute in 1881. They are gold-bearing arsenical sulphurets of iron (mispickel), carrying the theoretical proportions of 42 per cent of arsenic, 20 per cent of sulphur, and the remainder iron. The gangue is quartz, calc-spar, and some talcose, slaty rock, evidently resulting from the decomposition of the wall-rock, which on each side of the veins is syenitic granite.

The treatment of the ore consists of (1) crushing; (2) concentrating; (3) roasting; (4) condensing and collecting the arsenic fumes; (5) chlorination of roasted concentrates; (6) precipitation and melting of the gold.

Crushing.

The ore as it comes from the mines is dumped over grate bars at the top of the mill building; what is too course to go into the rock-breaker is broken by band, and all then goes through the No. 1 rock-breaker, which breaks it to a maximum size of 1¾"; then over fixed grate bars, which take out all pieces less than ½" (12 mm.) in size. The coarse then goes through two small rock-breakers, which crush it to a maximum size of about ¾" (20 mm.).

Concentrating.

The peculiarity of the Deloro ore is, that the gold is contained for the most part in the mispickel (which carries, when closely concentrated, nearly $100 per ton as an average); and this mispickel is much more friable than the associated quartz and calc-spar, which contain but small quantities of gold. The consequence is that, when the rock as it comes from the mine is coarsely crushed, we find the fine is composed for the most part of mispickel, and the coarse is quartz with a little mispickel. Taking advantage of this peculiarity of the ore, the mill was constructed so that the ore from the second crushers and the fine from the first crushers would go into the No. 1 revolving screen 20′ long by 5′ diameter, where it would be sized into *fine* (*i. e.*, passing through a mesh of less than ¼" (8 mm.), and the remainder into two sizes, which would go to coarse jigs (Bradford's), which are intended to separate into a rich and poor product, the rich after drying joining the fine from the No. 1 screen and going to the rich rolls to be crushed to the roasting size, and the poor going to the poor rolls and jigs. The object sought to be attained by this arrangement was the partial concentration of the ore without the usual loss in concentration; but as the roasting and chlorinating capacity of the Deloro works is yet far inferior to the mill capacity, it has been deemed wiser for the present to crush in the poor rolls all the ore as it comes from the second rock-breakers, and concentrate it in the jigs. The crushing is done dry in Cornish rolls 36" diameter, 15" face, steel shells on double cone centers.

The ore, after passing through the rolls, is elevated to the two No. 2 dry screens, which have a length of 8′ by 4′ diameter. In these the ore is sized. All passing through a 1½ mm. mesh is carried with a stream of water into the No. 3 screens. The size passing over 1½ mm., and which comes out of the end of the No. 2 screens, drops back into the rolls and goes through again. The fine ore is sized in the usual manner, except that the screens are much larger than usual, for the limiting capacity of such works is always found in the screens. Each set of rolls has a capacity of fully five or six tons an hour in grinding hard quartz and mispickel down from say 20 mm. to a maximum of 1½ mm.

The crushing (and consequently the screening in the No. 1 and No. 2 screens) is dry. The sized ore is concentrated in ordinary Hartz jigs, discharging through the bottom, and the slimes in Spitzkasten and on Rittinger tables. I would prefer other concentrators of greater capacity to these tables, though they do very fair work.

Roasting.

The concentrates are taken from the jig room in a tram car, which, going up an inclined plane, delivers them directly into a hopper over the drying furnace. This is an inclined revolving cylinder 20′ long, 36" diameter at small end, and 48" at large; and it has a conical addition of 24" in length at the small end, making the total length 22 feet. The fire passes through this cylinder, and the capacity has never been tested to anything like its limit, but no doubt it would dry two tons an hour if required. It is very economical in fuel.

As the dry ore drops out of this it is raised in a continuous manner by an elevator into the No. 1 roasting furnace. This is a revolving cylinder 30′ long, 60" diameter outside, lined with 4½ inches of firebrick, and with eight shelves running through nearly from end to end. These shelves are formed of key brick 9" long, so that they stand 4½" out from the lining.

In this furnace the arsenic and the greater part of the sulphur are volatilized, and pass out through a long series of arsenic condensing chambers, and through a centrifugal (Guibal) fan 8′ diameter, 3′ face, used to make the draft to the stack. The ore runs from the first cylinder through a pipe directly into the second cylinder, 20′ long by 48", with a 4½" lining and 6 shelves, where the roast is completed. The escaping gases pass to a stack, which also serves the drying furnace.

The air which feeds the No. 1 furnace is preheated by the escaping gases of the second cylinder, by passing through an air space between the two arches which form the top of the second roaster dust-chamber.

The two roasting cylinders are jacketed, first with an air space, and then with a covering of mineral wool, and paper over that. The whole arrangement of the roasting cylinders, their jacketing, and the plan for utilizing the escaping gases to heat the feed air for the first cylinder, are believed to be new, and are found very economical and efficient in practice.

The jacketing of the roasting cylinder will form the subject of another paper to be read at the next meeting of the institute.

The ability to make a sweet roast (such as is required for chlorinating) in a single operation, in continuous revolving cylinders, has been questioned by some metallurgists. In proof of its feasibility, I may say that, in the continuous arrangement above mentioned, we have roasted ten tons of concentrates in twenty-four hours, and to such perfection that, in the subsequent chlorination by the Mears process, we extracted from 93 to 98 per cent of the gold, as will be seen by reference to the following table:

Roasted Ores.		Average Value Tailings.	Percentage Extracted.
Tons.	Average Value Per Ton.		
16¾	$20.14	$2.63	86.94
19½	32.59	2.88	91.24
47	55.58	2.67	96.28
49	24.11	1.41	94.54
142¼	$35.19	$1.95	94.50

Condensation and Collection of Arsenic.

It was also asserted by some metallurgists that the roasting of arsenical pyrites presents many difficulties, but, after a pretty full experience with these Deloro ores, I can affirm, on the contrary, that they roast with much greater facility and in about two-thirds of the time necessary to roast simple sulphurets. They stand almost any amount of heat without fusing, and the arsenic, which forms 40 to 42 per cent of the mispickel, volatilizing at a comparatively low temperature, seems to leave the mass porous, thus facilitating the oxidation of the sulphur. The arsenic condenses readily in the series of brick chambers between the furnace and the stack.

The use of a centrifugal suction fan through which the furnace gases are drawn and the draft of the furnace thereby created, is also believed to be a novelty in metallurgy, which has here proved itself both practical and economical. It is clear that a blowing fan, which would occasion the escape of arsenical fumes, could not be used in this case.

Many important lessons have been acquired by experience at these works in regard to the construction of condensing chambers and the condensation of arsenic fumes, and I shall probably make them the subject of a special paper at some future meeting of the Institute.

Chlorination of the Roasted Concentrates.

The roasted concentrates are chlorinated by the Mears process, in charges of one ton, in a revolving lead-lined iron cylinder. The chlorine is made from chloride of lime and sulphuric acid, from 40 to 50 pounds of the former and 50 to 60 of the latter being used to a ton of ore. The pressure in the cylinder rises to about 40 to 50 pounds per square inch, and falls to 25 or 30 when the roast has not been so perfectly made as is desirable. The operation lasts about two hours, though probably much less time than this will be found sufficient to completely chlorinate the gold when it is in fine particles.

The completeness with which the gold is extracted is shown in the above table, which represents the whole amount of roasted ore chlorinated at the Deloro works, of which I have the headings and tailings assays. The ore and tailings were very carefully sampled, and every ton of tailings was assayed separately. Sometimes the samples from three tons of ore were united in one assay, but the tailings were as sayed ton by ton. The results were remarkably uniform, and after some experience had been gained, and especially after the second roasting cylinder was added, and the roast made more perfectly, the percentage extracted increased. This was also the case as the ore was concentrated more closely. The first 16¾ tons chlorinated were of partially hand-picked ore, crushed before the concentrating machinery was ready.

After making about twenty tons of concentrates, a closer work was made, and the concentrates frequently ran $70 to $85 per ton. In such cases the percentage of the gold extracted reached 98 per cent; and as the mean of 47 tons, containing on an average $55 58 per ton, the percentage extracted reached 96½ per cent. After that, the concentrating machinery having frozen up, unconcentrated ore had to be roasted; but, greater skill having been attained in the roasting, the chlorination extracted 94⅝ per cent. These results are considered as highly satisfactory both in roasting and chlorinating, especially when it is considered that they represent the first 142¼ tons roasted and chlorinated in the works, and that with almost exclusively unskilled labor.

Precipitation of the Gold.

The lime contained in the ore was found to give rise to quite unexpected difficulties in precipitating the gold from the chloride solution. The usual precipitant, ferrous sulphate, was found to throw down a voluminous precipitate of (principally) calcium sulphate along with the gold. In order to avoid this, we tried to get rid of the lime first by sulphuric acid. This was too tedious, and, after many annoying delays, the precipitation by charcoal was tried. The chloride liquor is allowed to filter slowly through a mass of charcoal, broken to say 1-16" to ¾" (1½ mm. to 12 mm.). The barrels are kept full of solution by the filtrate being brought from the bottom of one barrel in a rubber tube which terminates a few inches below the top of the next barrel. The precipitation of the gold is practically complete.

It may interest chemists to know that, though the lime does not remain in the charcoal, yet the liquor undergoes such a chemical change by its contact with the charcoal that the lime is no longer precipitated by either ferrous sulphate or sulphuric acid, but is by oxalate of ammonia.

Several chemists who have experimented with this Deloro chloride liquor, have considered that hydrogen sulphide, either in a saturated aqueous solution or as gas, or ferrous chloride, would make convenient precipitants, either of these reagents precipitating the whole of the gold without the lime. My own preference is for one of these rather than for charcoal.

The collection, drying and melting of the precipitated gold, is accomplished in the usual manner. The burning of the charcoal has not yet been done here; but in North Carolina, where the same process is in use, it is burned in an open iron pan with fire under, and it is claimed without loss of gold, and at a cost said to be less than six cents per ton.

Newspaper Mining.

While it does not become us to reflect upon the mining industries of other sections of our territory—and far be it from our intention to do so—nevertheless the absurdity of many of the newspaper reports that reach this office strikes us forcibly. Pima County, for instance, has had more mining on paper, more newspaper puffs and less returns from her mines, than any place we can imagine for the same period. Yavapai has had some very good mines, but those that have yielded the largest, like the Peck, Tiger, War Eagle, Tiptop and others, have either closed down or have become non-producers; and it is of newer property, and generally of lower grade, that now produces her present yield of bullion. The reports in the local papers, however, would lead a stranger to believe Prescott one of the most booming camps in the southwest. Maricopa papers fail to notice their only producer, the Vulture, but rush into praise of prospects that have never turned out a penny. These sections are not the exception, by any means, and the moral pointed is that newspaper puffing can not make a mine or a mining camp, and the utmost that the press can hope to do in this direction is to assist, unintentionally or otherwise, the manipulators of wildcat schemes to defraud outside investors. In an honestly managed mine, its output affords the only estimate of its value; and when it fails to produce, no amount of talking or writing can make it profitable. Take Cochise County out of Arizona's bullion and copper product, and the yield would not cut much of a figure among the list of mineral-producing states and territories; yet there is, perhaps, less said about these valuable properties in the course of a year by local papers than is accorded to some most worthless prospects in other parts of the territory. But this does not stop the stream of ore, the dropping of the stamps and the shipment of treasure, day in and day out the entire year through. Arizona is unquestionably a good mineral country, and if there were more work done on properties and prospects, and less on paper, Tombstone would not, perhaps, so deeply overshadow all other sections as a mining camp. *Benson Herald.*

THE IRON AGE.—The new iron mine discovered by Mr. P. F. Brown, of Los Angeles, has been named the Iron Age, and it is attracting much attention. While the business men of Los Angeles are negotiating to take advantage of this discovery, the people of Colton are hard at work to secure the business of the mine to their thriving place. It is reported that they have bonded the Cheney coal mine for $75,000, and have donated five acres of land adjoining both lines of railway, to a party of capitalists, on which to erect iron and steel works. Now what are the people of Los Angeles going to do to establish manufactures in this city? The ore from the Iron Age can be brought to Los Angeles as easily as it can be carried to Colton, and iron is in great and constant demand in this city for domestic use. A track can be laid from Alpine Station to the Iron Age mine in ten days, at small expense. But if our capitalists and land owners will not awake to the necessity of securing this business for Los Angeles, we shall be gratified to see our enterprising friends at Colton secure the prize. —*Los Angeles Herald.*

ANTHRACENE AND LIGHT.—According to *Engineering*, the substance known as anthraceue has been found by Dr. Tommasi to possess a new property, namely, a sensitiveness to light, which will doubtless prove of value. Anthracene, on exposure to light, acquires different physical and chemical properties, without any change in its composition. If a cold, clear saturated solution of authracene in benzol is exposed to the direct rays of the sun, it becomes turbid and deposits chrystals, which have received the name of paranthracene.

A California Cotton Mill.

We had a short paragraph recently upholding the benefits of home manufacturing, and expressing satisfaction that gratifying progress is continually being made in nearly all parts of the State. One of the most important movements, and interesting also because it is the pioneer establishment of its kind, is the projected cotton mill in Oakland, which is now being promoted by an incorporated company known as the California Cotton Mills Company. The objects of the company are to spin and weave cotton and to manufacture the usual articles made in cotton mills. The capital stock is $600,000. The board of directors is composed of the following: George W. Beaver, John Center, S. W. Rosenstock, L. Dinkelspiel, Captain J. C. Ainsworth, E. C. Sessions, V. D. Moody, A. Chabot and W. E. Miller.

We are informed that a tract of five acres of land has been secured in East Oakland, and that the company has also an acre upon the water front, thus insuring transportation facilities. The machinery will be ordered at once. The motive power and such other machinery as can be will be made here, but the looms and spinning machinery will be imported from Europe. As it will take several months for the machinery to arrive from Europe, work on the buildings will not be commenced immediately, but they will be ready for the machinery when it does arrive.

The company expects to obtain its supply of cotton primarily from Texas, which produces one-sixth of the cotton crop of the United States. There is cotton grown to some extent in this state. Messrs. Haggin and Tevis have between 200 and 300 acres in cotton on their property in Kern County, and Mrs. Strong, widow of Colonel Strong, the original cotton-raiser of the state, has grown 190 bales of cotton on her ranch, near Merced. The establishment of the cotton mills will attract more attention to the growing of cotton here, and this is quite practicable, for fine cotton has been produced in an experimental way in many different counties. There is also considerable cotton grown in Mexico, and quite a quantity comes here annually from Tahiti and the South Sea Islands, which can be made available. A man has been engaged by the company as its manager who has had twenty-one years experience at the business in Scotland, is a thorough mechanic and a practical man. About two hundred and fifty hands will be employed when the mills are in running order, and none but white labor will be employed, the major portion of which will be girls.

The Petroleum Boom.

The consant increase in the use of petroleum makes the business of petroleum mining, both for light and heavy oil, especially profitable. This is very encouraging to all persons eugaged in boring for oil in this vicinity. Seventeen years ago the price of oil was so low that it cost more for freight on a barrel of lubricating oil from the Ohio river to Boston and New York than the oil would sell for in those markets. As a consequence, the fine wells of lubricating iol were abandoned, and half the persons engaged in the production of that kind of oil were ruined. But steadily the introduction of this most valuable oil into the world's machinery as a lubricator has gone forward; and slowly but surely has it been introduced as fuel, till now in the oil region aloug the Ohio and the Little Kanawha, where oil of 28 gravity could not be sold for $1 a barrel in 1866, it now readily commands $20 a barrel, with a large demaud. This great advance is just what our oil men have needed, and they are going to work in right good earnest. A hundred wells will be sunk in Los Angeles and Ventura counties during the next twelve months, and there is a good demand for all the oil that they can produce, and the price will be rewarding. Our oil territory is a great bonanza, and Los Angeles is in the center of this favored portion of the Pacific Coast.

The Iron Age mine of magnetic iron ore has been sold to a company of heavy capitalists, and great steel works will be erected, and the manufacture of steel direct from the ore will be carried on in the course of a few weeks. This new and powerful corporation will be able to furnish a large demand for our petroleum, and we hope that the wells will be put down with all speed possible with safety, so that the fuel will be ready for these great works. People having oil territory should see that it is developed, and capitalists should assist with their means the industrious adventurers who are at work opening these rivers of oil, and who need plenty of money for the purchase of engines, tubes and tools.—*Los Angeles Herald.*

THE preliminary surveys for the Simplon Tunnel have been made by a commission of experts, who have pronounced against the route suggested, on account of the extreme heat likely to be encountered in the interior of the mountain —the normal temperature being estimated at nearly 98°—during the construction. In other respects the geological conditions are quite as favorable as those of St. Gothard. They propose, therefore, a line slightly different from the first proposed, which, though rather longer, would reduce the temperature to about 86°, and would afford better opportunities for ventilation.

The Engineer.

The Jordan Canal.

Doubts have been thrown on the practicability of the scheme for connectiug the Mediterranean with the Red Sea by way of the Jordan valley and Dead Sea. It is alleged that the engineering difficulties are greater than had been foreseen. The whole distance between the Dead Sea and the Red Sea is 108 miles, and though at either extremity there is for the first few miles an easy, gently rising sandflat, yet this soon gives place to rugged ascent. Beginning from the Gulf of Akabah, in the first thirty-five miles alluvial deposits and sand are passed over, but the ground gradually rises 600 feet above the level of the Red Sea. Even in the first fifteen miles the rise is 240 feet. The lowest point of the watershed is 780 feet above the level of the Red Sea, solid limestone and several bold porphyritic dykes intruding from Mount Hor eastward. To say nothing of the cutting from the Gulf of Akabah for thirty-five miles, where a slope has to be cut through which rises to 600 feet above the sea, there remains a mountain range of twenty-four miles to cross, varying from 170 feet to 780 feet in height, and after this a slope of six miles more till the sea-level is reached.

The writer leaves it to engineers to say how far the eight millions asked for will go towards this work. It is only just to the promoters of the canal, the Jordan Valley Canal Company, to mention that the whole of the facts about the heights of the different points in the Wady el Arabah referred to were known long ago to the promoters of the undertaking, and their estimates of the expense of the cutting have been framed to meet all the difficulties cited. Lieut. Vignes made his survey in 1864. Since then many things have happened. The present Suez Canal and Mount Cenis and St. Gothard tunnels were then thought to be impossible. Now they are not only made, but a tunnel under the English Channel has been projected, and M. de Lesseps is himself cutting a canal through the Isthmus of Panama, which, in consequence of the great depth of the cutting, and the mercurial condition of the river Chagres, renders it a far more difficult undertaking than the canal through the Jordan valley.

The Channel Tunnel.—The great bugbear with England in regard to the Channel Tunnel is the danger that it would open to invasion in case of war with France. As rediculous as the idea appears, engineers have proposed several ready ways to close the tunnel in such an event. The last proposition is from *Le Moniteur Industriel*, which urges the fortification, so to speak, of the Channel Tunnel by means of water, as a precaution to be adopted at both French and English ends, which might secure both nations from any fear of invasion. The system proposed is to consist of a small basin somewhat inland, with communications which can be opened and closed between the sea on one hand and the channel on the other, and also a steam engine and pump for pumping the water in and out. The admission of 176,000 gallons of water, it is estimated, would render the tunnel impassable without destroying the apparatus for illumination, telegraphing, etc., which it would contain, and which could be extracted when the danger was over without excessive expenditure of time and money.

Heavier Rails and Fewer Ties.—The heaviest rails used in this country do not exceed seventy-two pounds per yard, the average being sixty pounds per yard, or ninety-four tons per mile, while the best English roads use a double-headed rail weighing eighty pounds per yard. Allowing an average face to face cross-ties of nine inches, and 3,000 ties per mile, we have a wood-bearing surface of 2,250 lineal feet per mile of track. The English roads, with a heavier rail, have a much less number of cross-ties. A rail weighing eighty pounds per yard equals 125.7 tons per mile, and with cross-ties of nine inches face (average), and ten to each rail length, the English track has a wood-bearing surface of 1,432 lineal feet, about thirty-two per cent less than our own roads. That is what we shall eventually come to in America—a heavier rail and less wood on our road-beds. We think that it is not safe to use soft wood ties, such as white cedar or hackberry, save upon tangents, and then oak ties should be used at the rail joints, with only the best oak ties upon curves.—*Iron Age.*

The Proposed Saharan Sea.—Speaking of the proposed Saharan Sea, Dr. Bodichon, of Algiers, in a pamphlet just published, deprecates the formation of a vast inland salt water lake "till we find out to a certainty whether the salt water thus introduced may not penetrate to the fresh water sources underground, and deprive us of the means of obtaining artesian wells," etc. The writer also makes many curious observations concerning what, in his opinion, is the great taste for practical science in the nineteenth century, namely, the civilization of the Sahara and necessary changes of climate by artificial means.

Useful Information.

Original Discovery of Iron and Steel

In his address on technical training, delivered a short time since before the Alumni Association of Lehigh University, Dr. Thos. M. Drown, of Easton, Pa., pictures the discovery of metallic iron and steel as follows: "Nearly all the early discoveries in the arts were the result of accident or haphazard experiment. We can well imagine that a fire large and intense enough to reduce iron from its ore must often have been made in accidental contact with surface ore, and that the presence of the metal in the ashes must have attracted attention. This observation once made, there would follow a series of experiments to determine the conditions under which the metal was produced, and the substances necessary for its production. It would not long escape intelligent observation that a certain brown earth, or may be a black rock, was the substance which yielded the metal, and that fire was the necessary condition of its formation. But the iron thus accidentally produced—a mixture of metal, cinders and ashes—was of no value till further experiment revealed the fact that the metal could, when hot, be united by hammering into one mass, with the separation of cinder and other extraneous matter. The discovery of this property prompted still further experiment. The irregularity of the product would suggest the more perfect control of the fire, and small furnaces would be built. In the course of time it would be noted that the iron was not uniform in hardness, and an accident would be sure to reveal the fact that sometimes the metal, when suddenly cooled in water, would become intensely hard. This new line of investigation would result in the production of steel."

How Animals Have Foretold Earthquakes.

An Italian writer on the dreadful catastrophe which occurred so recently on the Island of Ischia, mentions those prognostications of an earthquake which are derived from animals. They were observed in every place where the shocks were such as to be generally perceptible. Some minutes before they were felt the oxen and cows began to bellow, the sheep and goats bleated, and rushing in confusion one on the other, tried to break the wicker-work of the folds. The dogs howled, the geese and fowls were alarmed and made much noise; the horses which were fastened in the stalls were greatly agitated, leaped up and down and tried to break the halters with which they were attached to the mangers; those on the road stopped suddenly and snorted in a very strange way. The cats were very much frightened, and tried to conceal themselves, or their hair bristled up wildly. Rabbits and moles were seen to leave their holes; birds rose as if scared from the places on which they had alighted; and fish left the bottom of the sea and approached the shores, where at some places great numbers of them were taken. Even ants and reptiles abandoned, in clear daylight, their subterranean holes in great disorder, many hours before the shocks were felt. The dogs, a few minutes before the first shock took place, awoke their sleeping masters by barking and pulling them, as if they wished to warn them of the impending danger; and several persons were thus enabled to save themselves.

Brazing Band Saws.—The Hoyt & Bro. Manufacturing Co., of Aurora, Ill., gives the following directions for performing this operation: File the ends of the band on opposite sides, to form two wedged shaped ends, having a lap of say ¾ inch long, which, when laid with their beveled and filed sides together, shall form a good joint of the same thickness as blade. Now clamp the ends on a piece of board, with the back of the blade towards you, with the lap brought fair together. Cut a piece of silver solder large enough to cover the lap, lay it between the lapped portion, with a little pulverized borax. Now, having a piece cut out of your board, say three inches wide, directly under your lap, heat your soldering tongs to a bright cherry red, and hold them pinched firmly on the lap until the solder flows freely from under the joint, then cool off the tongs and soldered portion of saw by pouring water upon the same, without relieving the pressure, until nearly cold. Try a file on both sides the blade, and should it be harder than the other part of the blade, reheat your tongs a little, and draw the temper by pressing the tongs upon the hard portion of the blade till partially heated, but not upon the lap, as it will weaken your joint. File off the solder, and joint to the same thickness as other parts, and the soldering of your band is completed.

Education in the Work Shop.—One of the New England manufacturing companies has introduced an educational qualification into its works, and is said to be discharging all employes who can not read and write. Before doing so, an opportunity was offered to all to qualify themselves, a night-school being established for that purpose. While this is an unusual proceeding, there is some good sense in it. Illiterate labor is, as a rule, the very poorest kind. While the mill operative may have no need while actually at work to either read or write, he will almost surely be a better and brighter workman at purely mechanical operations if he can and does read instructive publications and write in his leisure hours. The fact is recognized by the state that education is desirable, and the New England manufacturing companies simply apply to their own communities what everybody says is good for the population en masse.—*Philadelphia Ledger.*

How to Test Kerosene Oil.—It is a simple matter to test kerosene oil. The point of danger is called the flashing point, which is the degree of temperature at which it is evaporized and explodes. The lowest safe point is 100 degrees; 120 degrees is low enough for domestic use. To make the test, pour a small quantity of kerosene in a small saucer or tin vessel, and float it in a basin of water heated to 100 degrees. Apply a lighted match an inch or so above the oil, and if it takes fire it is dangerous. Have a thermometer in the water, and note the temperature as it falls, and the lowest point of flashing is easily ascertained; or the water may be gradually heated by adding boiling water from eighty degrees up, and the flashing point found.

A New Telegraph Soldering Iron.—A very convenient soldering iron for the use of linemen in erecting and repairing telegraph or telephone lines has been devised by Mr. J. O. Fry, of the National Telephone Company, Nottingham, England. The bit is hollowed out into a well for receiving a pool of liquid solder, a groove being formed to carry off excess into a chamber within the handle. The joint to be soldered is laid in this well. The iron is so constructed that new bits can readily replace the old, while the flat side of the iron is used in the ordinary way. By its means eight or more joints can be soldered at one time.

Borax is one of the best roach exterminators. It should be pulverized and sprinkled around the infested places.

Good Health.

What Paralysis Is.

Interesting and Profitable Medical Reading for Non-Medical People.

So common has the occurance of paralysis become in recent years, that non-medical people have a desire to know more about it. Many think that paralysis is a disease of itself. That some medical men so regard this condition is plain from the fact that deaths are frequently certified to have been caused by it. The incorrectness of this notion will, however, be plain when the conditions which give rise to paralysis are clearly set forth, and this we now propose.

A carpenter, blacksmith, or some mechanic whose business requires him to wield a hammer, finds some morning that he is unable to raise his hammer arm, or perhaps while at work the man suddenly feels his arm become numb and weak, it falls to his side, and he is no longer able to work. The doctor to whom the man applies says a "brachial monoplegia from muscle tire," which means simply that the man has overwrought his hammer arm and it needs rest. To these cases the very appropriate name of "artisans' palsy" is given. Again, a poor-blooded, nervously constructed person, most likely a woman, meets with a great shock or has to endure an unusual and prolonged mental or physicial effort. Soon, and perhaps without warning, the individual loses the use of some part of the body, often of the vocal apparatus, and the patient is unable to speak above a whisper. The doctor says "hysterical paralysis," or "hysterical aphonia," loss of voice. Now just how this comes about we fancy it would puzzle the most learned doctor to say. Concerning this condition, however, as well as the one before mentioned, this much is known, viz., that by appropriate treatment they recover perfectly and promptly, very good evidence that no part of the nervous apparatus is broken. The faith cures reported from time to time are probably cases of the kind last mentioned.

It sometimes happens that an intoxicated person will fall asleep with the head resting upon the arm or with the arm hanging over a chair back. When the person wakes the arm is numb; it tingles and is paralyzed—another "brachial monoplegia"—but really pressure upon the trunks of the nerves which supply the disabled member has affected those nerves so that they are unable to perform their usual duty. The nerves which go out from the brain and spinal chord to the extremities are quite comparable to the wires which are streched from place to place for electric communication, and pressure upon one section of those nerves produces results very like those which follow an interference with the wire. The case just given illustrates very well a large number of cases of palsy from pressure, for pressure upon the brain or spinal cord, or the nerves which have their exit therefrom, will produce a palsy whose extent will depend upon the extent of the pressure, and whose durability will depend upon the chances for removing the pressure. Pressure upon the nerves which supply one side of the face produces a very characteristic paralysis, and one that causes many laughable mistakes on the part of tyros and non-professional people by their attempts to detect the affected side. Pressure upon the brain or spinal cord is mostly due to the presence of tumors, to fractures of the skull, or bones of which the backbone is formed, and to blood clots within the skull or spinal canal. Patients who recover from diphtheria, scarlet fever, and some other acute sickness, are frequently paralyzed in some part. These cases generally recover by appropriate treatment, and it is quite probable that many cases would recover spontaneously. The remarks before made concerning certain cases which recover will apply equally to the cases just named.

People who work in lead are liable to a peculiar form of paralysis, which is first seen, as a rule, in the muscles of the forearm, on account of which the patient is unable to extend the hand upon the arm. At times the whole muscular system is involved. Change of occupation and the use of remedies which will assist the elimination of the mineral from the system is the proper course for such patients. Analogous forms of paralysis are caused by arsenic and mercury, probably by their action upon the nerve structure of the spinal cord. Woorara, the Indian arrow-poison, will also produce paralysis if introduced into the system in sufficient quantities. The paralyzing effect of large doses of alcohol are well known. Certain conditions of the circulatory apparatus predispose to extensive and often incurable paralysis. The arterics are elastic tubes. By age, hard work, care and the prolonged use of alcoholic drinks, these tubes lose their elasticity and become brittle. By some event which determines an unusual quantity of blood to the brain one of these now inelastic tubes is broken, the poured-out blood clots, as before mentioned, and a paralysis immediately follows.

Owing to certain systematic conditions, fibrin, a substance normally suspended in the blood, lodges upon the flood-gates—valves—of the heart. Presently a part of this matter is dislodged and washed away into the blood; perchance it reaches an artery in the brain which will not permit it to pass. This at once cuts off the blood supply from a part of the brain, one of the immediate symptoms of which is palsy of the part of the body which receives its nervous supply from that portion of the brain. These paralyses are usually extensive, and are not readily distinguishable from those just mentioned.

The presence of worms in the bowels of children is believed to produce paralysis in some cases. Such cases, being due to a known removable cause, are described as reflex paralyses. These are not seen alone in children, but in adults as well. Finally, changes in the structure of the brain or spinal cord produce paralysis, varying in extent with the extent of nerve structure involved. Such paralyses are especially obstinate in those of advanced years. Change of structure in the spinal cord usually produces disability in the legs. Now, these are the most common causes of paralysis, and from what has been said, it will be observed that paralysis is not a disease of itself. Neither is it always incurable.

Labor and Food.

The human body never ceases to work. Even in the most profound slumber some of the functions of life are going on, as, for instance, breathing, the circulation of the blood, digestion, when there is food in the stomach; and it follows that some part of the nervous system is therefore awake and attending to business all the day and night long. In the act of living, some of the substance of the body is being constantly consumed. The amount of work done by the heart in one day in propelling the blood is now estimated as equal to the work of a steam engine in raising 125 tons one foot high or one ton 125 feet high. We lose in weight by working. Weigh a man after several hours' hard labor, and he will be found two or three, and, in extreme cases, several pounds lighter. If we do not wish to become bankrupt, we must replace by food the amount we have lost by labor. Hunger and thirst are the instincts which prompt us to do this. They are like automatic alarm clocks, which stop the engine at various points to take on fuel and water. In a healtby man as much is taken in as is required to maintain the weight of the body against loss. Nature keeps the account. On one side is so much food spent in work; on the other, so much received into the stomach for digestion. They should balance like the accounts of an honest bookkeeper. In an unhealthy person the instinct of hunger becomes disordered and does not sound the alarm, and so the person goes on working without eating until he becomes pauperized; or the instinct works too frequently, and he eats too much and clogs the vital machinery. A calculation of the business done in the body reveals the fact that for a hard-working person about 8½ pounds of food and drink are used up daily; some bodies use more and some less, but this is the average. The profit which the body gets on this transaction has been calculated, and may interest our readers. The energy stored up in the 8½ pounds of food ought to raise 3,400 tons one foot high. Most of this energy, however, is expended in keeping the body warm and its functions active. About one-tenth can be spent in our bodily movements or in work. The profit, then, on the process is about ten per cent. This is enough to raise 340 tons one foot high each day—a profit which is quite enough for earning a good living if rightly expended, and it is probably more than most make; but all ought to strive to reach this point if possible.

MINING AND SCIENTIFIC PRESS.

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SAN FRANCISCO:

Saturday Morning, Oct. 20, 1883.

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Passing Events.

There is no news of any special moment from the mining regions other than we give in our "mining summary." It is near the close of the season on the more mountainous regions. In Montana and Idaho the cold weather will soon set in, and many mines will he closed down. The larger and better equipped mines, however, will continue to work. In this state, New Mexico, Arizona, and most parts of Nevada, work can go on all winter. But prospectors will soon he going into winter quarters, and leave the mountainous regions. So far in these latitudes pleasant weather continues. There are rumors of some new mining fields in Arizona, but nothing definite is known as yet.

MECHANICAL POWER.—By this term is meant any pressure acting tbrough a certain space with a certain velocity which can be converted into a greater pressure with a less velocity through a smaller space, the quantity of mechanical force or power remaining unchanged; and all that the above so-called mechanical powers are used for is to effect this transformation. They do not and can not create power or force, because that is eternal, and can neither he created nor destroyed. It requires just the same amount of force to lift one pound through 100 feet as it does to lift 100 pounds through one foot in the same time.

GERMANY is making warlike preparations all along the Russian frontier. Men are working day and night on the lines of defense, and a number of ironclad turret-ships are being constructed.

ALL implicated in the recent rebellion in Egypt have been granted amnesty, except those convicted of murder and outrage.

The English Predilection for Incorporating Companies.

In contemplating the many companies formed in this country for the prosecution of mining and other enterprises, one not well acquainted with the facts might he led to conclude that we surpassed all other peoples in the multiplicity of these schemes, designed to promote our industrial interests. As compared with the English, however, we may he said to do very little in this direction, there being perhaps a score of these associations in the city of London to one in even the largest city in the United States. In the average Briton the commercial instinct meets with ahnormal development, a proclivity that is fostered hy the vast accumulations of capital in the British metropolis. Much of this capital is idle, and ever seeking profitable investment. Hence the readiness witb which money is embarked in any projected scheme that promises large or even moderate returns.

In so far as the manufacture of the more staple commodities is concerned, this branch of business is apt to he engaged in hy individuals or small unincorporated companies, who carry it on in a careful aud systematic manner, some one, or more likely all the memhers of the firm, giving to it their personal attention. But when it comes to mining, the manufacture of some new-fangled machine, or the vending of some article, useful or otherwise, as a patent mouse-trap, a peanut roaster, a clothes-wringer, or a quack medicine—a stock company is forthwith organized, and the investing public invited to buy sbares at the " up-shot," or, as we term it, "bedrock" price. Astonishing, and to the American mind incredible, are the number and nature of the objects for the promotion of which these joint-stock companies are incorporated. Recourse is had to them as a means of furuishing the public with electric light, gas and water, for disposing of nightsoils and the city sewage, for the manufacture of patent medicines and patent manures, for supplying bihles to the converted, and hrass idols to the unregenerate heathen. If at any time there arise a scarcity of Japanese curios or Chinese crackleware these Londoners proceed at once to form a company for makiug such class of goods, and so, if the market hecomes bare of any other article of utility or virtu.

As to the mining enterprises of these Englishmen, they extend to all parts of tbe civilized world, and even to some parts that are not much civilized. They have home companies and foreign companies organized to operate not only in England, Wales, Ireland and Scotland, but also in India, Africa, aud Australia, South and Central America, Mexico, and the United States. They not only mine in all countries, but for all kinds of metals and minerals—for coal, copper, lead, iron, and tin athome, and for every thing that possesses economic or commercial value ahroad. It matters little tbat they meet with only disappointment, as in India; not until it has been thoroughly tested do they withdraw from the field. He is naturally bopeful and plucky, is John Bull, and rarely abandons an undertaking until he has made an energetic and persistent effort at success. Hence the much money and the many years sometimes spent in these frnitless enterprises.

Though they oftener fail, these Britons are apt to do more to entitle them to success in their mining undertakings than the Americans. In the first place these English companies conduct their affairs usually with more precision and system than is done in this country. Besides an annual report made by the President of the company to the shareholders, the Superintendent of the mine is required to prepare and forward to the home office a weekly statement of expenditures made, progress of work, ore extracted, hulliou turned out, the condition and prospects of the mine, etc. From these weekly statements the President of the company, or Chairmau, as he is there called, makes up his annual report, adding such further information as he may be possessed of that would be of interest to the shareholders, most of whom make it a point to attend these annual meetings. It is the habit of English shareholders to not only attend these regular meetings, but to interest themselves earnestly and actively in every thing pertaining to tbe affairs of the company, asking questions of the Chairman when they desire further information, and criticising his report if they think it open to objection or censure. These meetings are sometimes the scenes of very animated discussions, either hetween the Chairman and memhers or members themselves. This watchfulness of officials, though quite unlike the American metbod, is much to he commended, as tending to secure on the part of officers and employees greater economy and care in the discharge of their duties.

The Day of Small and Better Things.

If reports emanating from the newspaper press in the mineral regions may he credited, mining is in a prosperous condition throughout most parts of California. Making due allowance for the over-sanguine views of the local journalist, this industry would seem to be in a tolerably healthful if not exceedingly flourishing condition. That the mass of those engaged in this business are doing moderately well there is good reason to believe, advices through our own correspondence and other reliable sources of information tending to confirm this view. While the shortness of the water season has served to curtail somewhat the product of hydraulic mines, this has worked to the advantage of those engaged in river-bed operations, the most of which are making out extremely well. This branch of mining is engaged in extensively on Scott River for five or six miles ahove its junction with the Klamath, also along the latter stream for a considerahle distance both ahove and helow the mouth of Scott River. In this vicinity river-bed miniug has heen carried on for twenty years or more, latterly on a very extensive scale, and always with good, though, as is everywhere the case with this branch of mining, with varying success. Along the Salmon, Trinity, and other of these northern rivers, this business is pursued in a smaller way, heing largely in the hands of the Chinese, who practice chiefly by the method of wing-damming. As they select the sites of these operations with care, prospecting them thoroughly the preceding year, these people generally make good wages in so reclaiming and working sections of the river beds. Should the water remain at its present low stage for a month longer, a great deal of gold will this season be taken from the heds of these northern streams.

In quartz mining, the condition is more than merely healthful; this interest is prospering beyond what it has ever done before. Besides good progress made generally over the state, mines in new localities are being successfully opened up, as in the Calico district, San Bernardino County; Deadwood, Trinity County; and elsewhere. So, too, more work is heing done and hetter results are being reached in the older districts, where the business, owing to various causes, had suffered a relapse, work for years having heen suspended in many of the mines or heen pushed only in a feeble way, some claims having been entirely ahandoned. All through Plumas, Sierra, Nevada, and El Dorado counties we have examples of this kind. In Amador, Calaveras, and in counties further south, instances of resuscitated mines, and even of entire districts, are to he met with. It is noteworthy that this improved condition of the quartz interest is without that excitement and over-confidence that in earlier times led to premature and reckless expenditure , and often to ruinous speculation. The business is now carried on quietly and temperately, work being planned with judgment and money expended with economy and care. Men do not talk so extravagantly now as aforetime, nor do they get excited over a big clean-up, nor go crazy at the sight of a rich piece of quartz. The day of hig expectations and big things has happily departed, and the day of small and better things come in its place; and this is fortunate for all—fortunate for the capitalist, because there comes with it reduced expenditure and greater security; and fortunate for the laborer and miner, because they are forced to the adoption of more steady and healthful habits, whereby they loose less time and save more money in the end. "Easy come, easy go" is a saying the truth of which has found sad confirmation in the lives of California miners, a class that will probably lay up more money now, with the changed condition of things, with wages at only two dollars per day, than they did when the wages they received were two or three times as much.

The removal and reworking of the tailings that have accumulated in the mountain gulches and along some of the river-beds lower down constitute a class of operations to which not much attention has heen given till lately. Work is now in progress, or has been completed, at several places on opeu cuts for running off and washing these deposits, which ar known to contain a great deal of gold, which, by reason of the fineness of the particles or of tbeir heing imhedded in hard cement, escaped from the miners' sluices at a first washing of the gravel. The retention of these deposits in the places where we now find them is due generally to the presence of rocky ledges running across these gulches, and which have prevented the escape of auy but the finer sand and silt or matter held in solution in the water. Most of the gold, including all mixed with the cements and conglomerates, is supposed to have remained behind with the coarser gravel and other heavy material. Though known to be rich in gold, the considerable cost of running these open cuts through the hard hedrock has deterred parties from undertaking their construction until recntly. That they will answer the purpose intended, and pay largely in the end, is pretty well estahlished by the success that has attended one or two works of this kind already completed aud in operation.

Classes of Titles to Mines.

Three distinct classes of titles are created by the mining laws of the United States. These have been defined hy the Secretary of the Interior; as, 1. Title in fee-simple; 2. Title by possession; 3. The complete equitable title.

The first vests in the grantee of the government an indefeasible title, while the second vests a title in the nature of an casement only. The first, being an ahsolute grant by purchase, and patent without condition, is not defeasible; while the second, being a mere right of possession and enjoyment of profits, without purchase, and upon condition, may be defeated at any time by the failure of the party in possession to comply with the condition; viz., to perform the labor or make the annual improvements required by the statute. The equitable title accrues immediately upon purchase, for the entry entitles the purchaser to a patent, and the right to a patent once vested is equivalent to a patent issued.

Section 2,324 of the Revised Statutes, which defines the sizes of claims locatahle, and provides for forfeiture on failure to comply with the conditions, has reference solely to titles hy right of possession, aud does not in any way conflict with titles acquired by purchase, for in the latter case both must be in one and the same person. A title by right of possession is the lowest grade of title known to the mining laws; the next is the equitable title, wbich accrues upon purchase and entry; while the third and final grade is the fee-simple, which is acquired by pateut evidencing the legal title and merging this in both the possessory and equitable titles.

Where lands are acquired under the pre-emption laws, it sometimes occurs that the legal title may be in one person and a superior equity in an another; but this can not occur under the operation of the mining laws, for all legal and equitahle adverse titles and claims must he presented to and passed upon by the courts prior to the issuance of patent, or be considered as stale or abandoned. This question was expressly decided upon by Judge Field in the case of the Eureka Mining Company against the Richmond Miniug Company.

The First Locomotive.

EDITORS PRESS:—Is not the PRESS in error, stating, in its issue of October 6th, that "the disastrous fire at Pittsburg destroyed the Exhibition Building with its valuable conteuts, including the first locomotive ever run in the United States?"

The first locomotive run in the United States was tbe "Lion," manufactured in Strowhridge, England, and known as the "Strowbridge Lion," the head of the hoiler being ornamented with the representation of a lion's head.

It was taken on canal-hoats from New York to Kingston, on Esopus Creek, and from tbence hauled to the Honesdale and Carbondale railroad, where it made the first trip ever made by a locomotive in the United States, the engineer being Horatio Alleu, who, I believe, is still living in the enjoyment of a hale and hearty old age.

The "Lion" was found to be too heavy for the track, and was shortly replaced by others, constructed under Mr. Allen's supervision, at the West Point Foundry.

The boiler of the old "Lion" was in use several years in a machine shop at Carbondale, but the other portions of the engine were destroyed.

The power of the "Lion" was communicated to the wheels hy means of two walking-beams.

THEODORE L. CHASE,

Turkey Creek District, A. T.

The Foss Rolling Shutter.

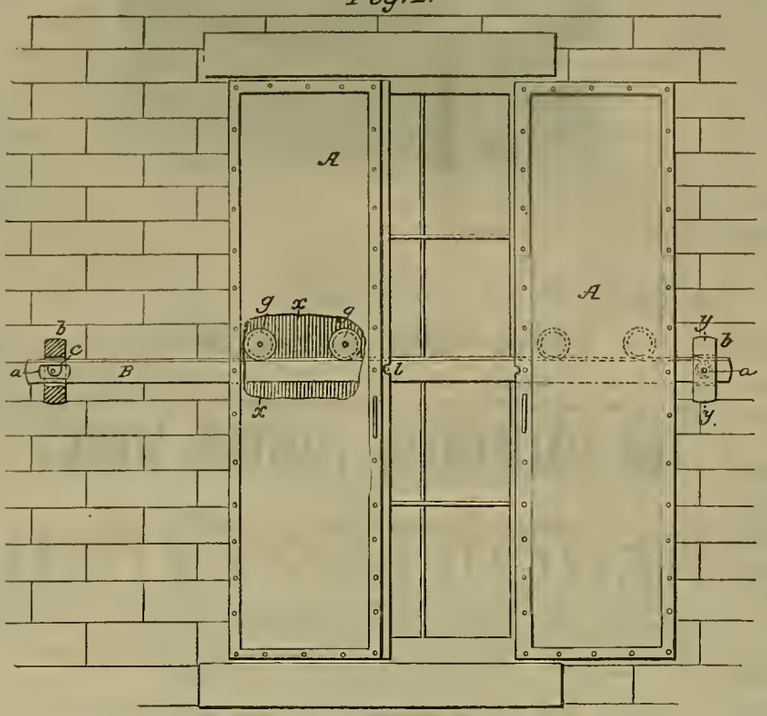
The engravings on this page illustrate an improved iron shutter that can be readily opened from the outside, and at the same time easily opened from the inside. The shutters are of ordinary construction, made of two thicknesses of sheet iron, with a space between them that may be filled with a non-conductor of heat, if desired. The shutters *A* rest upon a cross-bar or track *B*, preferably of steel, attached at its ends to the wall of the building in a peculiar manner. There are slotted castings *b* in which the track rails rest, the slotted bar, or track, entering loosely through these castings. On the bolt *b* and within the slot of the bar are eccentries *c*, by which the bar, or track, is clamped to the casting. This is shown in Figs. 1 and 4. This construction allows the bar to expand from heat without springing, which might prevent the free working of the shutter. The other end of the bar *y y* has the eccentric but not the slot.

The object of the eccentrics is to allow adjustment of the shutter if the walls settle, or the shutter works too closely to the window-sill. The ends of the bolts are square, to receive a wrench for the adjustment of the eccentrics. A nut on the other end olt of the bholds the eccentric in position, as well as the casting and shutter to the building.

The track *B* passes between the two sides of each shutter and through an iron box or casting that is fitted within the shutter, as shown at *x*, in Fig. 1. This casting that contains the grooved roller or sheave *g* is held in place by cross-bolts, as shown in Fig. 2. The sheaves *g* roll on the bar *B*. Fig. 2 is a section of the door with the casting and sheave. Fig. 3 is a section of the house wall, showing method of securing the slotted castings and eccentric by the square-headed bolt. The shutters are made with their inner edge rabbled to lap one over the other, and the supporting bar is provided with a center pin to prevent each shutter from passing beyond the center. Handles inside and out are provided for moving the shutters.

Iron shutters as usually made are good to protect buildings against fires in adjoining houses, but when the building on which they are is on fire, they prevent access to it by the firemen. So firemen think iron shutters have caused more loss than they have prevented. With these shutters of Mr. Foss, however, this objection is overcome, because they can be opened from the inside or out. They can be made to work inside the walls of a building, and be as effectual in case of fire as if on the outside; or it can work in spaces in the walls if desired. The shutters may be opened from the inside with ease and safety in high winds, and may be left more or less open as required. They will not slam or blow loose in storms. These rolling shutters cost but little if any more than the old-fashioned swinging ones, and may be applied to an old or new building equally well. N. A. Foss, of Clendenin, Meagher County, Montana, is the inventor of this device, and offers it for sale to manufacturers either by state right or royalty. Any farther information which may be desired may be obtained by addressing the inventor.

Fig. 1.



THE FOSS ROLLING SHUTTER IN PLACE.

Fig. 2.

Fig. 3.

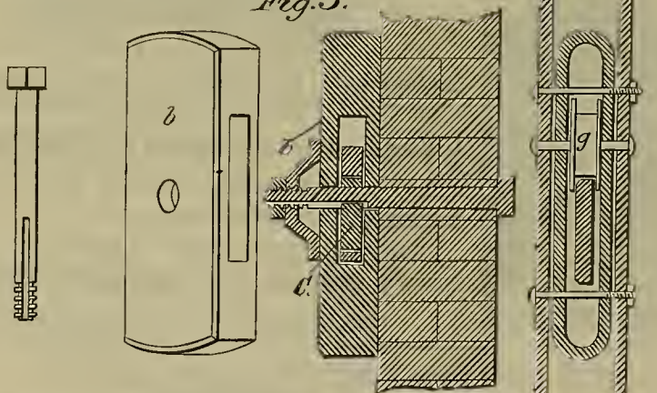
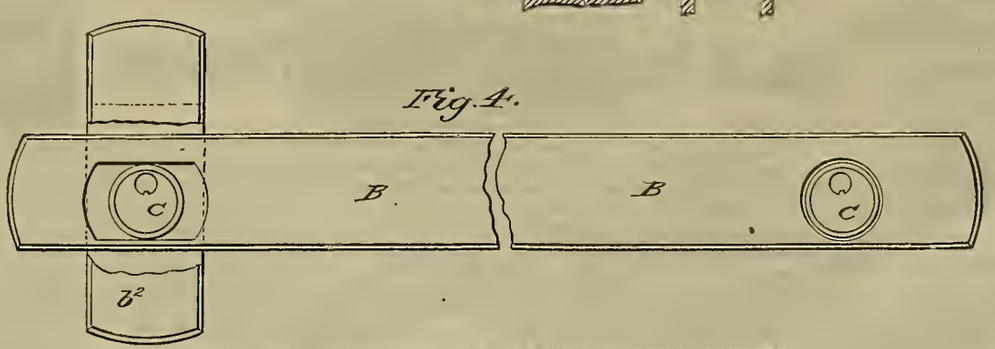


Fig. 4.



DETAILS OF CONSTRUCTION OF THE FOSS ROLLING SHUTTER.

Dr. Koch, of the German Commission which went to Egypt to investigate the cholera epidemic, reports that he discovered that the cholera is due to a living thread-like microscopic organism, resembling that seen in cases of phthisis.

New Ore Concentrator.

William E. Stirk, of Leadville, Col., has just received through the Mining and Scientific Press Patent Agency, a patent for an ore concentrator having a combined rotary and oscillating movement. The combination of devices form an improvement on the concentrator patented by J. S. Duncan in 1882. The pan or concentrator is placed on a central hollow discharge-shaft, or post, which is fixed to the foundation timbers. A sleeve surrounds the upper part of the hollow shaft. In the center of the pan is a flat disk surrounding the top opening of the hollow shaft, and forms by its thickness a slight dam to arrest the lower stratum of sand as it flows towards the central opening of the hollow shaft. The pan, as it will be seen, discharges from the center.

The outer portion of the pan is made of stout sheet-iron riveted to the flat disk or flange described. The improvement consists in providing thin metal rings of such a size as to fit snugly around the central disk or flange, and project above it. Several of these rings of different depths may be fitted to this flange, so that any depth of sand may be maintained. These flanges work inside of each other like the joints of a telescope, or a pocket cup, so as to be raised or lowered to regulate the height to suit the work to be done. The bottom of the pan slopes downward to the periphery, where it curves upward, to form the sides, and a channel is formed around the outer edge of the pan, within its periphery, into which the sulphurets are caused to settle by the peculiar oscillating rotary motion of the pan. Suitable gearing causes the pan to rotate, and it is also given a secondary shaking motion while revolving around the main central shaft.

A Sacramento man, by the aid of a steamboat, promises to supply the residents along the Sacramento river with groceries.

Roasting Silver Ore Containing Gold.

For chloridizing roasting of silver ores containing gold without subsequent treatment by chlorine gas, the ore containing the silver and gold is roasted with salt, converting thereby the silver into a chloride, while the gold remains in a metallic condition. This mode of roasting is quite satisfactory for the subsequent amalgamation in pans. But if these metals are intended to be extracted by a solving process where no amalgamation takes place, the gold must also be converted into a chloride while roasting. In roasting ores in which gold and silver are present, with salt, chloride of gold is formed, according to Plattner; but before the ore becomes red-hot the gold loses a part of its chlorine—is reduced to a sub-chloride, and at a little higher degree of heat to metallic gold.

Mr. Kustel says, in his "Roasting of Ores," that to form chloride of gold by way of roasting, a better result is obtained in the furnace if the ore is roasted first without salt till the smell of sulphur is no longer perceptible; and then, after it has cooled down to a low temperature, the salt is added, and the whole stirred for some time. A suitable form for the furnace would be a small hearth or furnace, altered in such a way that the second hearth should be ten or twelve inches below the first. The arch of the first hearth, however, should continue in a straight line. By this means the space is widened and the temperature brought down to the proper degree.

The ore is charged in the first hearth near the bridge, and roasted in the usual way, oxidizing the sulphurets. When this is effected, the ore is shifted over in the lower furnace, and the upper charged again. As soon as the roasted ore assumes a dark-red heat, the salt is introduced and baked for two or three hours. According to Roeszner, a combination of gold oxide and chloride of sodium ($Au^2 O^3 Na Cl$) is formed.

It is not soluble in water, and but slightly in salt solution, and can not be amalgamated; but it is soluble in hyposulphite of soda or lime. V. Lille and others consider the gold in the state of a sub-chloride. Hot water can not be used for the purpsoe of leaching out base metals, as the chloride of gold would be decomposed.

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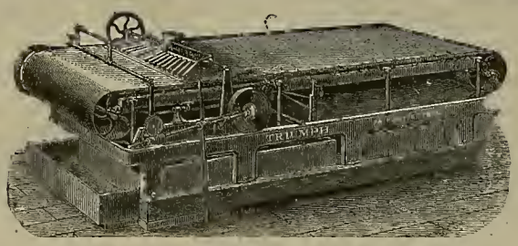
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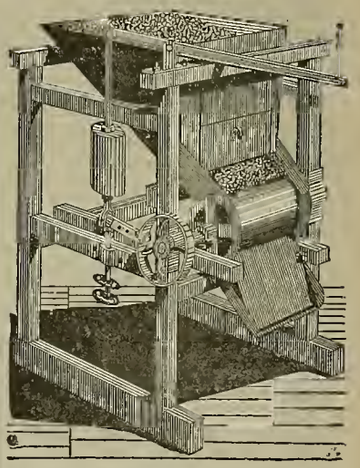
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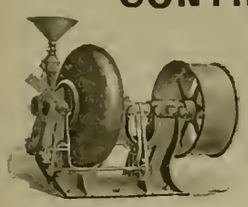
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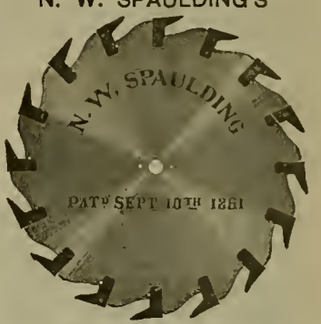
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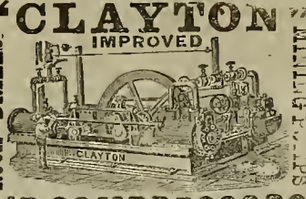


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Andre, in his "Coal Miniug," points out and explains the principles which should guide the conduct of operations, as follows:

An explosion is a sndden transformation of a substauce from the solid or liquid into the gaseous form. The actiou is similar to that which goes on in a steam boiler. The application of heat to the water contained in the boiler transforms that substance from the liquid into the gaseous form, and as the gases into which the liquid is couverted tend to occupy a much larger volume than the liquid from which they are derived, a pressure is caused tending to burst the boiler, and the intensity of this pressure will depeud upon the relative volume of the gas. In that case, the transformation of the water iuto gas proceeds slowly, and the full effects are not obtained nntil after a considerable lapse of time. If, however, the water could be suddenly flashed into steam, as happens wben a jet is directed upon a red-hot irou plate, the full pressure would be produced at once, and a result very much like au explosiou would ensue. If, instead of the water, gunpowder were plaeed in the boiler, and beat applied, wben a certain degree of temperature was reached the powder would flash into gas, n the same manner as we have supposed the water to flash into steam, and the same effect of pressure would be produced on the boiler. The pressure of a fluid, it must be borne in mind, is exerted equally in all directions, and consequently every square inch of the metal will be subjected to the same strain. Hence it is obvious that if the boiler bursts, it will yield in the weakest parts, and the line along which the fracture would run in such a case is called the line of least resistance. It will appear from the foregoiug that an explosion is merely the sudden application of great pressure; so sudden, indeed, as to partake of the character of a blow. But though the forces developed are thus suddenly applied, their action is in all respects the same as when the application is gradual and slow; and in considering their action, therefore, it is only necessary to assume a slow evolution of gascs to determine it with precision.

As in the steam boiler the full pressure is not attaiued until the whole of the water has been converted into steam, so in the case of an explosive compound the full pressure upon the containing body is not developed until the whole of the substance has been converted into gas. When gunpowder is fired in the open air, the gases escape as they are formed, and the pressure developed upon the body upon which the substance rests is equal to the resistance opposed by the air to the escape of the gases. The value of this resistauce will obviously increase with the velocity possessed by these gases. It is the pressure due to this cause that forces the rocket to ascend, and it is evident, from the relation subsistiug between the pressure exerted and the velocity of evolution of the gases, that the more rapid the combustion of the substance the greater will be the velocity of ascent. If the rocket-case were made sufficiently strong, and the gases retained within it until the whole of the substauce was transformed, the pressure e erted against the uside of the case would continue to increase as the transformation was effected; and if, when the latter was complete, the gases were allowed to suddenly escape from the end, the rocket would ascend with the maximum attainable velocity, or if retained in its position the gases would exert upon it their maximum lifting force. These facts explain the differeuce in the effects produced by the slow and the quick explosives when fired in the open air. When gunpowder, for example, is fired in this way upon a stone, the downward pressure developed is not great; but when nitro-glycerine is fired by detonation under the same conditions, the stone is crushed or fractured. Even gunpowder will produce similar effects if detonated. The different pressures produced in these cases are chiefly due to the differences in the rapidity with which the trausformation of the substance takes place. Hence we see the value of detouation. When a substance is detonated, the vibration caused by the detonator produces a simultaneous evolution of gases from each molecnle of the substance detonated, and consequently the maximum force is developed at once, instead of gradually, as iu simple explosion. Suppose now a charge of slow

Explosive Placed in a Vertical Bore-Hole

In stroug rock, and fired. Here the gases can escape only in one direction; and as the area upon which the air presses is much less than when the charge was exposed on all sides but one, the velocity of the air must be much greater to allow the same volume of gases to escape in the same time. Consequently the pressure exerted upon the bottom of the hole will be greater than that exerted upon the stone; and as the pressure is necessarily equal in all directions, the same pressure will be exerted against the sides of the holes. As the action of the explosive is quickened, assuming this conditiou possible, the resistance of the air, and consequently the pressure upon the bottom and sides of the holes, will increase until its maximum is reached, when detonation or instantaneous transformation is effected. This maximum, it must be borne in mind, is necessarily equal to the resistance opposed by the atmosphere; and though it may be sufficient to fracture the rock, it does not represent the whole of the force developed by the explosive: a large proportion is expended in giving velocity to the air in the bore-hole, and another portion is lost as heat communicated to the rock. The quantity of heat lost in detonation is less than in simple explosion, because the gases are in contact with the rock during a shorter interval of time. Thus a larger proportion of the force developed is rendered available by detonatiou. Moreover, as gunpowder when detonated may be used in much smaller quantities, the surface of rock exposed to the gases will by such means be proportionately reduced, and consequently the loss of heat will be lessened in a like degree. This coustitutes another source of economy of the force developed by the explosion; but as the greatest loss is occasioned by the comparatively slight resistauce of the air in the bore-hole, the most important saving is to be sought in this direction. It is obvious that by substituting for the air a more strongly resistant substauce, a larger proportiou of the force developed may be reudered available; in other words, a proportionately greater pressure will be exerted upon the sides of the bore-hole. By this means, which is known as "tamping" the hole, a sufficient force may be thrown against the sides of the hole to fracture the rock, which is the end proposed in blasting. It is also obvious that economy of force requires that the materials employed as tamping should be of the most resistant character obtainable.

ZINC PAINT FOR CAST OR WROUGHT IRON.—A process of painting, as a substitute for galvanizing, has been invented by Messrs. Neujeau & Delaite, of Liege. It is specially intended for objects of large dimensions, which can not well he moved, and therefore cannot well he dipped into a bath of melted zinc. The zinc, when finely pounded, is simply mixed with oil and siccative. In this way a varnish is obtained, which is applied with a brush in the usual manner. A single layer is sufficient, but two are preferable. The coated objects can be left as they are, or bronzed or painted as required.

It is reported that the Russian Nihilists have formally sentenced the Czar to death, and much excitement prevails amongt the Socialists in New York City. One of these, a notorious conspirator, sailed for Europe on Saturday. It is said that the royal family of Russia are deeply concerned over the situation, and that even the iron nerve of the Czar has given way before his incessant apprehension.

Boys Here and Elsewhere.

The boys seem to be the coming problem everywhere. It does not sem to matter much whether they are good boys or bad boys, so far as the general trouble is concerned, for in countries where the boys are good the question is, "What can our boys do?" and in countries where boys are bad the question is "What can we do with our boys?" According to the latest statement from abroad it appears that in England, where there are good boys, if boys are good anywhere, there is nothiug for them to do by which they ean earn a decent livelihood. In Californiа, where boys are generally reputed to be indescribably bad, there is plenty to do, but the boys won't do it. And thus the boy becomes a problem nearly everywhere. In fact girls are rather becoming fashionable as offspriug, and the father whose family is petticoated throughout is to be congratulated.

There is a peculiar state of affairs in England, according to the latest local authorities, and a condensation of the mass of conflicting views expressed is as follows:

Those taking part in this interesting discussion agree on only one point, namely, the difficulty of finding openings in professional or mercantile life, or even of securing employment for the sons of the middle class. The opinion most commonly expressed is that fathers of that class—merchants, lawyers and tradesmen—make the mistake of educating their sons to a higher level of pursuits than they ought, and neglect to provide for the contingency of mediocrity by apprenticing them to mechanical callings of a lower social grade. There are many, however, who maintain that the artisans are mainly at fault in over-educating their boys, and in this way rendering them discontented with their own rank in society. It is urged that there would be room enough for the boys of the middle class, if the sons of working people were not encouraged to rise above their station and push their way into clerkships and professional vacancies. The fact, moreover, that skilled laborers are constantly emigrating in large numbers is adduced as a convincing proof that the mechanical trades are already overcrowded, and that the sous of the middle class will not gain any material advantage by a retrograde movement.

By analyzing these statements it would appear that the trouble in England is too many boys. If the factories lacked hands, if tradesmen were short of clerks, if farmers had no workmeu, if machine shops were silent because the metal-mongers were few—then it would do to say, perhaps, that the boys were being over-educated, or rather falsely educated, because rightly applied processes of education do not war with industry. But there is no lack of help in the trades and manufactures, and no opening for profitable employment of the boys, for we read again as follows:

The man who suggests the occupation of lace draughtsman as a suitable one for middle class boys is immediately reminded from Nottingham that "every gentleman" in that town is making his son a draughtsman, and that the trade is "flooded out," so that experienced operators, after a seven years' apprenticeship can only earn from eighteeu to twenty shillings a week. The proposal that a "gentleman's regiment" shall be recruited from the class that cannot find clerkships or professional employment is at once amended so as to restrict its membership to university graduates who are unable to earn a living. An outcry for more dentists and veterinary surgeons is met with a counterclaim that there are so many of them already that they are emigratiug to Australia.

Thus it seems that England is nearly as badly off with her good boys as we are with our bad ones—they are both eating their heads off and doing nothing. If there could be arranged a sort of an internatioual boy exchauge, it would be a grand thing for us. If we had a few thousands of those good English boys who are calling for work and can't get it, just think how happy would be a father's lot in this state, for such a well disposed force of workers would make every family independent of the hired-help puzzle, and our fruit-growers could order their boys by the score, iustall them in their parlors, and marry their daughters to them with perfect safety, for they are good boys, well educated and crying for work.

In return for this boon England would receive our boys who will not work, will not behave themselves, will not do anything but raise Cain generally. Verily, the sound of the walloping in English homes would be loud, nor would the rod be spared nutil the boys were beaten into some condition of decency aud obedience. This would be a great humanitarian enterprise: the English youth would get what they seem most to yearn for, and that is a chance to work, and the Californiа youth would get what they most need—a good, generous and persevering walloping.

British Postal Service.

The following interesting figures have been compiled from the annual report of the Postmaster-General of Great Britain and Ireland for the fiscal year ending March 31, 1883 Number of letters delivered in the United Kingdom duriug the year, 1,280,636,200—increase, 42 per cent; postal cards, 144,016,200—increase 6.4 per cent; book packets and circulars, 288,206,400—increase 6.3 per cent; and newspapers, 140,682,600—the slight decrease is owing to their being sent as parcels. One London firm posted 132,000 letters for a single mail, and another firm 167,000 postal cards, while circulars posted by single firms at one time numbered from 44,000 to 56,000. The average of letters per capita was 40 in England and Wales, 30 in Scotland, 16 in Ireland. Mr. Fawcett, Postmaster-General, estimated that the average number of letters per capita in 1881 was, for the United States, 21; France, 15; Germany, 13; Italy, 6; and Spain, 5. Post-offices in the United Kingdom number 15,406, employing 44,600 permanent officers. Of this number 2,561 are women, 455 clerks, and 2,106 counter women. On the retired list are 355 officers with pensions aggregating $884,130 per annum. The "good conduct stripe" for letter-carriers, which was formally confined to London, has been extended to the provinces, at a cost of $315,000. A stripe entitles the wearer to 25 cents extra pay per week, and by continued good conduct he can win three stripes. Reply postal cards have been introdnced, but have met with poor success.

After a careful examination of these figures, postoffice officials here assert that the postal system of this country is operated at a cost much less than that of the United Kingdom, especially when the great extent of country is taken into consideratiou.

In the United Kingdom, 32,092,026 telegraph messages were sent for the year 1883, an increase of 746,165 as compared with 1882. The number of messages sent in London was 12,374,707, against 2,071,034 in 1881–2. During the past year 102 postoffices and 45 railway station offices were opened for telegraphic work, making the total number of telegraph offices 57,742.

The gross revenue from telegraph was $8,740,300, and net revenne $1,177,850.

News in Brief.

SECRETARY FOLGER says it is probable he will issue a call for three per cent bonds. The amount of the call is not decided on.

AT Grass Valley the other day a little girl was seriously injured by being dragged some distance by a calf which she was holding with a rope.

THE Treasury Department has purchased 404,000 ounces of fine silver for delivery at the Philadelphia, New Orleans and San Francisco mints.

THE highest point on the Rocky Mountains reached by the Northern Pacific is 1,200 feet below the summit of the Sierras on the Central Pacific.

A FEW gentlemen of London have contributed £6,000 to pay the preliminary expenses of a six months' session of Moody and Sankey at Islington.

IT is charged that sick and disabled animals condemned at the stockyards are brought across the line and retailed in Kansas City as healthy beef. The subject is to be investigated.

A CABLEGRAM announces the death of Professor William Danton, the geologist. He is supposed to have been in Java at the time of the earthquake, and to have been one of the victims.

THREE well dressed Chinamen were in Key Port, New Jersey, during the past week, endeavoring to find a place in which to start a laundry, but were unsuccessful. No landlord would rent to them.

THE last spike of the Kansas City, Springfield and Memphis railroad was driven at six o'clock Saturday evening, thirty miles west of Memphis, and there is now an unbroken line between those cities.

THE men in four of the prescription houses in Pittsburg have been ordered out by the American Flint Glass Union, because the manufacturers employed boys to do journeymen's work. About two hundred men are idle.

UNDERSTAND THE SITUATION.—The Chinamen have already begun to realize the benefits of shutting out competition from an increase of their numbers, and are generally demanding an increase of wages. This is being done both by house and field hands, and the situation will be serious to the housewife unless there are considerable accessions of more desirable people than the Chinese.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING OCTOBER 9, 1883.

280,260. CHAFE PAD FOR HARNESS—C. W. Burgtorf, Petaluma, Cal.

280,293.—SEEDER AND HARROW—D. W. Clinton, Lemoore, Cal.

280,401. FIRE PROOF BUILDING—W. H. Dolman, St. Helen, Or.

280,436.—GRAIN HEADER—F. Hickman, Red Bluff, Cal.

280,442.—PLASTIC COMPOSITION FOR TAILORS' CUTTING BOARDS, ETC.—M. Hughes, S. F.

280,314.—TWO-WHEELED VEHICLE—Geo. Larsen, San Leandro, Cal.

280,316.—DERRICK TABLE AND FEEDER FOR THRASHING MACHINE—M. N. Lanfenburg, S. F.

280,207. CAR COUPLING—A. Lenhart, Portland, Or.

280,451. HYDRAULIC ELEVATOR—Lesouru & Lotan, Portland, Or.

280,223. ROCK BREAKER—L. Radovich, S. F.

280,342.—ORE CONCENTRATOR—W. E. Surk, Leadville, Col.

280,509.—FRUIT DRIER—C. W. Vetter, Ukiah, Cal.

280,564.—TRACK LAYING MACHINE—F. F. Voigt, Walla Walla, W. T.

280,352.—TICKET DISTRIBUTING BOX—S. B. Whitehead, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific Coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

GANG PLOW.—James M. Fix, Bird's Landing, Solano Co., Cal. This patent covers certain improvements in that class of gang plows in which the axle is pivoted, and is adapted to be moved obliquely with the line of travel, whereby it is rendered specially serviceable for sidehill work. One of the improvements is in the racks with which the levers to raise the plows engage. The improvement consists in doing away with certain strains by bolting these racks right down to the axle instead of on top of high standards, the axle being made wide for the purpose. Another improvement consists in the adaptation of the cranks which raise and lower the axles to receive the wheels at either end. By this means the wheels may be kept out of line or nearer in line, as desired. The invention also provides a guard and protector for the spring of the crank levers.

TRACK LAYING MACHINE.—F. F. Voigt, Walla Walla, W. T. No. 286,564. Dated Oct. 9, 1883. This invention relates to the class of track laying machines, in which a peculiar car provided with the necessary appliances for handling the material is joined to and made to precede a construction train carrying the material. It consists in a novel means for carrying the material to the front, in a novel means for handling the cross-ties and rails, in a novel means for switching the material trucks, to avoid interference, and in certain other details of construction.

CHAFE PAD FOR HARNESS.—Chas. W. Burgtorf, Petaluma. No. 286,260. Dated Oct. 17, 1883. This pad is intended to prevent chafing on the side of the horse. It consists in a flap of leather sewed into the bend or fold of the hame tug, just inside or back of the trace buckle, and adapted to receive the back-hand, whereby it is held flat, and said buckle is prevented from rubbing or chafing the side of the horse. This invention is particularly adapted for double harness, as the trace buckle is brought in closer proximity to the horse than in single harness.

TWO-WHEELED VEHICLE.—George Larsen, assignor of one-half to John F. Hopper, San Leandro. No. 286,314. Dated Oct. 9, 1883. This invention relates to certain new and useful improvements in two-wheeled vehicles, and it consists in a novel connection between the shafts and axle, the object of which is to permit the independent movement of the shafts while affording support to the axle, to prevent it from turning, and also to admit of regulating the height of the shafts.

POST DRIVER.—Harry E. Fairman, Plymouth, Michigan. No. 285,881. Dated October 2, 1882. The improvements in this post driver consist in means for adjusting the vertical guides for raising and tripping the weight for setting the machine, and in numerous details of construction which render the appliance more effective for its purpose.

INVALID mothers, weak children, nervous and fretful infants are benefited by using Brown's Iron Bitters. Harmless but efficacious.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

A Prospector in Alaska.

As there has been so much interest expressed of late as to the mines of Alaska, and as many are inquiring in relation to the same, we publish the following letter from Jacob Knause, now in Alaska, to Mike Burns, of Helena:

JUNEAU, Alaska.

You wished to know something about this country. I will try and describe it as well as I can. The placers are nothing extra. With the exception of about six claims, they do not pay good wages. They are all situated on the hillside, where no one would look for gold. The seasons are very short. They did not get to work this year until June, and they will probably have to shut down in September, or October at the latest. It is the most disagreeable place to work in the ground sluice I ever saw. It has rained almost every day since we got here, but if it did not rain they would have to stop work for the want of water. The diggings are all in what is called the basin. It is high up in the hills, and a few frosty nights dries up all the water. Last year the boys did not get to clean up their last run, as it froze early and did not thaw out again until this spring. The gold is all very fine, and goes but $16 to the ounce, and has to be clean to do that. There is an island across the bay from Juneau, which is called Douglas Island, where they found pretty good pay. From one claim, situated on the beach, and called the Ready Bullion, they took out $20 per day to the man for awhile, but that is worked out. Others were struck a little higher up that paid well, but are not doing much now. As for the quartz, it is pretty good what there is to be seen. They have done nothing with it yet. There are about fifty locations in the basin that no work has been done on yet, except enough to hold them. The float is rich. One howlder that weighed almost 1,000 pounds was crushed last September, and they got about $1,200 out of it, besides a large amount of specimens. The quartz is almost all galena ore, and the gold can be seen sprinkled in the galena. There are two five-stamp mills here; one about half-way between here and the basin, where it was put for custom work, but is not running this summer. The other is on Douglas Island, on the Paris quartz location, brought there for prospecting the claim. I have been working in the tunnel there for about seven weeks. The quartz is low grade, but the largest deposit that was ever known. It is about 600 feet wide, and how long they do not know. There are six locations on it, or where they think it is. It dips under the slate in places, and then comes out again in a large bunch. There is very little country rock in it. Some of it works much higher than others, but the whole hill will pay, I think—that is, the way it will be worked. There will be a 100-stamp mill upon it in the spring, so they say. We ran out of powder, and had to lay off until the steamer gets here. The country here is very rough, and covered with moss. You can not prospect except on the mountain tops or where the water cuts through the hill. The timber is very dense—hemlock, spruce and alder being the only kinds found here. The underbrush is so thick you can hardly get through. It is mostly herry bushes and "Devil's Chips"—well named, too. It is a long curved stem with leaves about a foot wide on top. The stem is covered with thorns, which stick into the flesh wherever it touches; so you see it is a fine place to prospect in. A party of five have just got back from a trip about 400 miles northwest of here, but did not strike any thing but a deposit of black sand. It is pretty, but I do not see how they can work it. It is very heavy and mostly magnetic iron. It is on the beach. The place is called Yucatat. It was where the two men were killed three years ago by the Indians. There are three parties out from here this year on the headwaters of the Yukon. They go from here in boats to a place called Chittcat, where they leave their boats and cross the range, about 30 miles. They have to pay $9 a 100 for packing across the range. Then they whip-saw lumber and build boats. There is a chain of lakes from there down to the Yukon River, and some terribly rough canyons to go through when they strike the river. It is all up stream work.

GOOD health, rosy cheeks and beautiful skin, ladies can get by using Brown's Iron Bitters.

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OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

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Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing only one cent) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some responsible party requested to stop it, we shall positively demand payment for the time it is sent.

SEEK

health and avoid sickness. Instead of feeling tired and worn out, instead of aches and pains, wouldn't you rather feel fresh and strong?

You can continue feeling miserable and good for nothing, and no one but yourself can find fault, but if you are tired of that kind of life, you can change it if you choose.

How? By getting one bottle of BROWN' IRON BITTERS, and taking it regularly according to directions.

Mansfield, Ohio, Nov. 26, 188r.

Gentlemen:—I have suffered with pain in my side and back, and great soreness on my breast, with shooting pains all through my body, attended with great weakness, depression of spirits, and loss of appetite. I have taken several different medicines, and was treated by prominent physicians for my liver, kidneys, and spleen, but I got no relief. I thought I would try Brown's Iron Bitters; I have now taken one bottle and a half and am about well—pain in side and back all gone—soreness all out of my breast, and I have a good appetite, and am gaining in strength and flesh. It can justly be called the *king of medicines*.

JOHN K. ALLENDER.

BROWN'S IRON BITTERS is composed of Iron in soluble form; Cinchona the great tonic, together with other standard remedies, making a remarkable non-alcoholic tonic, which will cure Dyspepsia, Indigestion, Malaria, Weakness, and relieve all Lung and Kidney diseases.

NOTICE TO CREDITORS.

ESTATE OF ROSEMOND GREENWOOD, deceased.—Notice is hereby given by the undersigned executor and executrix of the last will and testament of Rosemond Greenwood, deceased, to the creditors of, and all persons having claims against the said deceased, to exhibit them with the necessary vouchers, within four (4) months after the first publication of this notice, to the said executor and executrix, at the office of E. W. Blaney, Esq., attorney-at-law, No 526 Montgomery Street, the same being the place for the transaction of the business of said estate, in the City and County of San Francisco.

Dated at San Francisco, the 2d day of October, 1883.

GEORGE SPAULDING,
MARY WILLIAMS,
Executor and Executrix of the last Will and Testament of ROSEMOND GREENWOOD, deceased.

Books for Miners and Millmen.

KUSTEL'S CONCENTRATION OF ORES (of all kinds), including the Chlorination Process for gold-bearing sulphurets, arsenurets, and gold and silver ores generally, with 120 lithographic diagrams. 1887. This work is unequaled by any other published embracing the subjects treated. Postpaid $7.50. Printed and sold by Dewey & Co., S. F.

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INVENTORS. L. PETERSON, MODEL MAKER,

258 Market St., N. E. cor. Front, up-stairs, San Francisco. Experimental machinery and all kind of models, tin, copper and brass work.

INFORMATION WANTED.—Information is wanted of Wm. Erskine, who has been living near Hailey, Alturas county, Idaho Territory, for two years past. His wife has not heard from him since last Spring. He was President of the Miners' Union of Silver City, Idaho, five or six years ago. Any news of him would be thankfully received by Mrs. Hannah Erskine, of Nevada City, Cal., or R. H. McDonald, Los Angeles, Cal.

Dewey & Co. { 252 Market st. } Patent Agt's.

Mining Companies.

Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

ASSESSMENT NOTICE.

Seaton Gold Mining Company.—Location of principal place of business, San Francisco, California; location of works, Drytown, Amador county, Cal.

NOTICE is hereby given that at a meeting of the Board of Directors, held on the 25th day of September, 1883, an assessment (No. 1) of ten cents (10c.) per share was levied upon the capital stock of this corporation, payable immediately in United States gold coin, to the Secretary at the office of the Company, Room 6, No. 528 California Street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 1st day of November, 1883, will be delinquent and advertised for sale, at public auction, and unless payment is made before, will be sold on Monday, the 19th day of November, 1883, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

A. MARTIN, Secretary.

OFFICE Room 6, No. 528 California Street, San Francisco, California.

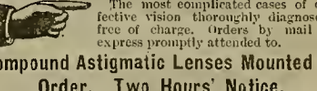
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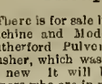
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Cheap Ore Pulverizer.

There is for sale in this city, by I. A. Heald, American Machine and Model Works, 111 and 113 First St., a Rutherford Pulverizer, an improved revolving barrel crusher, which was only used a few times and is as good as new. It will be sold very much below cost, and miners who are in need of such an appliance for a small mine will do well to make inquiries concerning it. It is suitable for a pulverizing mill for powder or other substances. Reference as to above can be had upon applying to this office.

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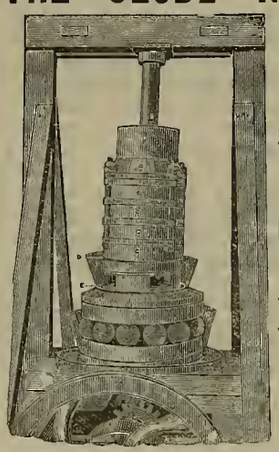
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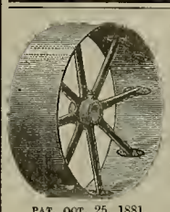
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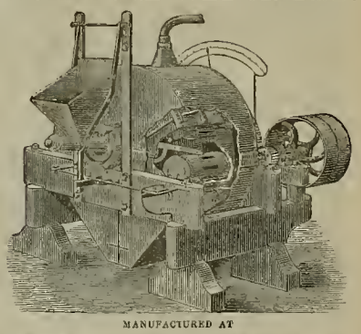


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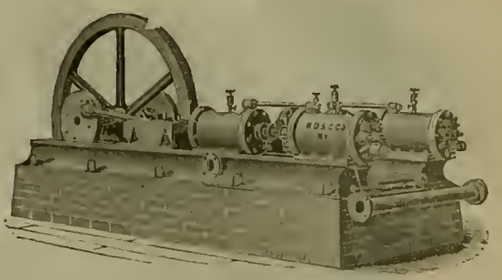
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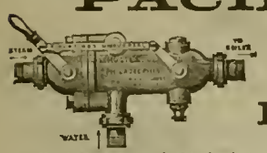
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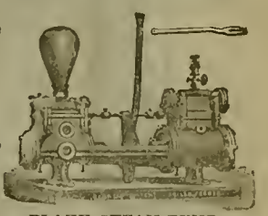


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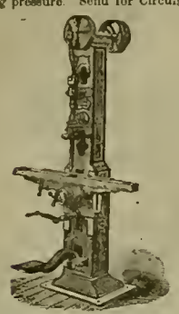
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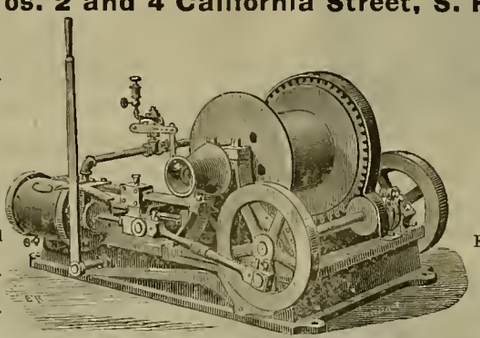


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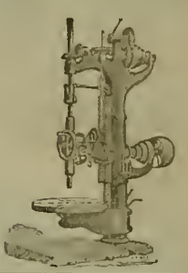




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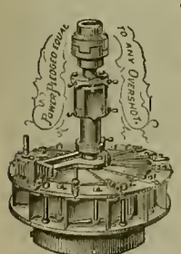
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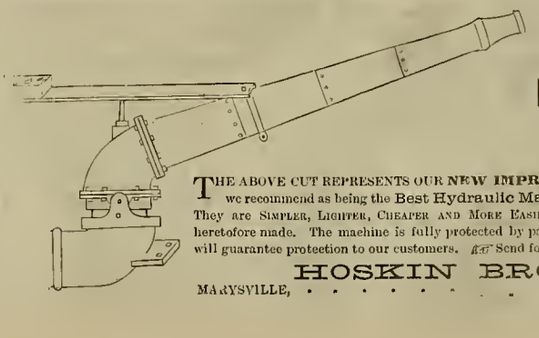
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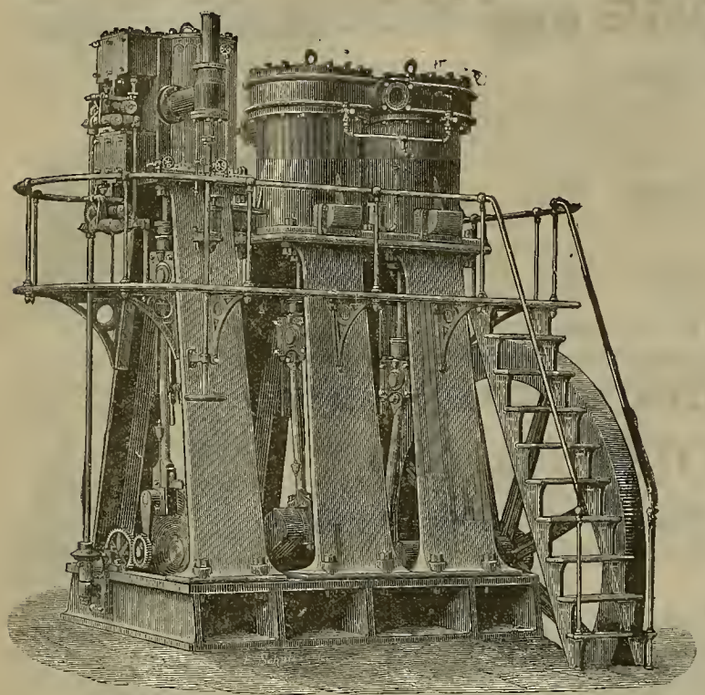
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SPECIAL ADVANTAGES.

Ahsolute certainty in the action of the valves at any speed. Perfect delivery of the air at any speed or pressure. The heating of the air entirely prevented at any pressure. Takes less water to cool the air than any other Compressor.

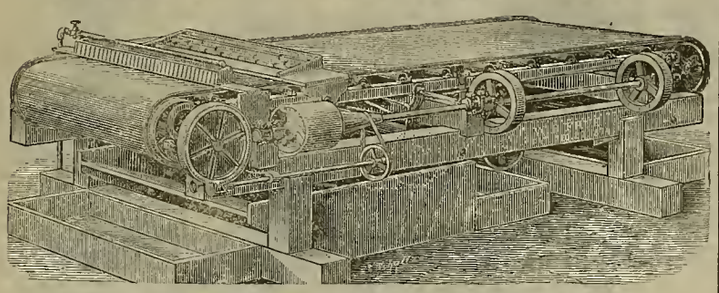
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DISPLACEMENTS in air cylinder perfect. Showing less leakage and friction than our competitors and a superior economy of about 20 per cent.

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That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.

That the patent laws make *users* of infringements responsible as well as makers, and the public is therefore warned that there is considerable risk in purchasing any end-shake machine until our various patents have been decided.

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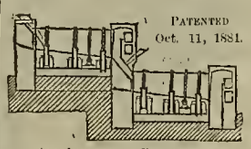
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Nov. 6, 1882



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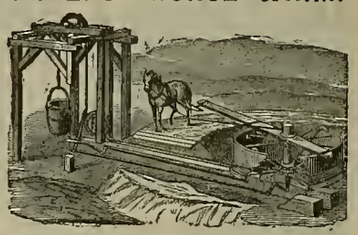
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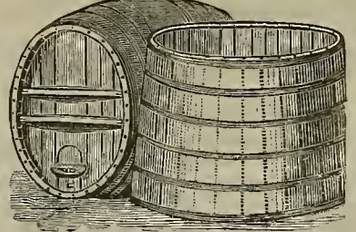
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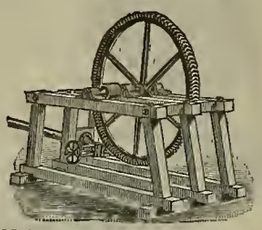
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VOLUME XLVII Number 17.

THE MARKET STREET CABLE ROAD.

A DETAILED DESCRIPTION OF OUR LATEST AND MOST IMPORTANT CABLE LINE.

One of the regular "sights" of San Francisco, to the tourist or visitor, is its cable railroad system, now illustrated by numerous lines in daily operation. The latest of these, and by far the most extensive one, is the Market street line, which, with its several branches, goes through the heart of the city, and from the water-front to the suburbs. The projectors of this road are men of wealth and experience in railroad building, and determined to build the road in a manner that would make it as substantial as possible, and have spared no expense to that end. The road cost into the millions. Its equipment is first-class in every respect; and it has been not only satisfactory to its owners, but to the public. Traveling mainly on a street where there are some eight other lines of street cars, it immediately became the favorite, owing to the convenience and comfort of its cars, the speed at which they travel, and the frequency at which they pass.



VIEW AT THE FERRY TERMINUS OF THE MARKET STREET CABLE RAILWAY.

On account of the novel features of this new road, and the general interest taken in the subject of these cable roads, we have had a number of engravings specially made to accompany this description. These will give not only a good general idea of the appearance of the cars, roadbed, etc., but many details of construction also. To engineers, this number of the PRESS contains much data of interest, and the general reader will also find it valuable for reference. The cable railroad system is now spreading so rapidly that all the large cities in the United States will soon have cable lines. As we built the first of these roads here, our experience is useful to all others; and, no doubt, most of the roads built in the future will look to those in this city as examples for guidance.

The building of this road has had the effect of enlivening, so to speak, a large tract of this city. For some years, south of Market street and out by Valencia, the city has been rather "slow," the northern and northwestern portions improving much more rapidly, and having improvements of better character. The length of time it took to get out towards the Mission and thereabouts, or even Market street to 10th and 12th streets, was detrimental to those portions of the city. The cable cars now go from the ferry to the end of Valencia street in 34 minutes, and run frequently. All those portions of the city which the road or its branches tap have already felt the good influence of rapid communication, and the improvements will be even more plainly manifest within the next year.

The Road and its Branches.

The main line of the road runs on the principal thoroughfare of San Francisco—Market street. The streets north and south of this all open into it, and the traffic is larger than on any other avenue in the city. Not only do the north and south streets, such as Kearny, Dupont and Stockton, and Second, Third and Fourth, open into Market, but the streets north of it running across Kearny and Dupont, such as O'Farrell, Sutter, Post, Geary, etc., also open into it. This latter line of streets run at an angle from Market. The lower ends of the cables of the Sutter and Geary street cable roads are at the junction of these respective streets and Market. The peculiar central position of Market street, therefore, makes the road a highly important one. It was supposed by many that a cable railroad on that thoroughfare would be almost impracticable, owing to its crowded state at certain periods of the day. Many thought the cars would have to be moved so slowly that they would be unpopular. Experience has, however, proven these fears to have been unfounded. In fact, the line makes better time than any of the cable roads, the cable running about eight miles an hour; and, including an average of 30 stops, the cars run from one end to the other at a rate of about 7½ miles an hour.

It has been found, too, that the speed at which the cars are run tends to make people more cautious than on slower roads. Moreover, the track is kept clear easily. Teamsters know that the cars run fast, and at the first sound of the gong clear the track, not taking their time about it, as is apt to be the case with slower roads. People are not apt to try to run across in front of these cars, but seem rather to prefer letting them pass. The quick speed, therefore, has been advantageous to the road, and is very satisfactory to the public.

There are several branches to this road, transfers for which are given passengers without extra charge, the fare being five cents. At Fifth street is a horse-car branch, one mile long, running south. At McAllister street is a cable railroad branch, which will be in running order in about a month. There will be a separate cable to Market street, run by a separate engine, and the cars will switch off from this to the Market street cable at the junction of the two streets. This branch makes another complete line from Golden Gate Park to the ferry.

At Hayes street there is a horse-car branch out to Hayes Valley, through a populous neighborhood. The next branch to the right is that of Haight street. Every other car on the main line switches off here to go out Haight street to Golden Gate Park. We give a profile of this line in another column. At the end of the Haight street line a road is being built to run as far as the Pacific Ocean beach and Cliff House. This will be run by steam dummies, and will be a separate line from Haight street, though connecting with it. This ocean line will soon be done, and it will be possible to go to the ocean beach for ten cents. The Haight street branch is a very important one, and the city is building rapidly out in that direction. Opposite the main line engine-house is the Market street extension branch, soon to be run by an independent cable, provision having been made in the engine houses for the cable for this branch. It is one mile long. Baldwin locomotive dummies are now running the cars on this branch.

The grade on Market street is 3½ feet in 100. The grade on Haight street is about 12½ feet

(CONTINUED ON PAGE 295.)

Copper Slime Treatment.

The following paper was read before the American Institute of Mining Engineers, by F. G. Coggin, of Lake Linden, Michigan, at the Roanoke, Va., meeting:

"If you could only get that motion into a machine," said a gentlemen, as he watched the process of making a "van" on a shovel, and saw the copper roll up to the highest point, "it would beat the world for slime dressing." This idea has led to many an effort to get that peculiar motion, called the "vanning motion;" and so cams, eccentrics, eccentric gears, levers, bell-cranks, toggle-joints, links, springs, etc., have been brought into requisition, while a contribution has been laid upon all the conceivable motions, rolling, tumbling, swinging, jerking, tossing, dropping, tripping, intermittent, regular, and irregular, or a combination of some of them, to which have been added percussion, concussion, and more discussion—all in a vain attempt to combine in a single machine the consecutive motions of the shovel, in washing, flowing, and tossing the van. The Patent Office Reports, and the various mills of the country, show, as a result of this, a lot of gimcracks, most of which never went beyond a first trial, finding their way to the scrap-heap. Others still running might as well be there; while some have considerable merit for dressing other and richer sands than copper.

It does look tempting to see that clean edge of

Copper Climbing up the Shovel-Blade;

But those who have seen in it such visions of large fortunes have not considered the time it takes to make a van, compared with the small quantity treated upon the shovel; and this points to the reason for the failure of all that class of machines called "vanning machines," when used for dressing copper slimes, namely, a lack of capacity. The writer has come to this conclusion through an experience with the Rittinger side percussion-table of the most improved make, sent from Germany to the Calumet and Hecla Mining Company, and with the Ellenbecker tables, used by the same company, both of which are good types of that class of machines. In both of these machines, the tables are suspended by rods which allow them to swing, and they can also be adjusted for the purpose of varying the inclination of the table. In the Rittinger machine, the motion of the table is at a right angle to the flow of the slime, being produced by a wiper-cam which throws the table against a spring, which throws it quickly back against a stop, the percussion throwing up the mineral. In the Ellenbecker table, the motion is with the flow of the slime, and has a quick return, produced by the use of eccentric gears, the idea of the latter being taken from the valve-gear of the old Ball steam stamp. The estimated capacity of the Rittinger machine was eight tons per twenty-four hours; but it would not properly treat over five tons in that time, or about fifty pounds per square foot of floor space taken up by the machine. The Ellenbecker table has about the same capacity. The assay of slime was about 1.3 per cent; that of the tails, .97 per cent. This is not considered very good work. Of other

Machines for Dressing Slimes,

the best known are the fixed round buddle and the revolving table; perhaps the Frue vanner may be included in this class of machines, although, having had no experience with the latter, I can say nothing with reference to its capabilities. The principle governing the concentration upon both the former is the same. In the one the table is fixed, while the distributing and washing apparatus revolves; in the other the table revolves, while the rest of the apparatus is fixed. The revolving table is the most largely used in this country—the design of Mr. Evans, of the Atlantic Mine, Michigan—being almost exclusively used in the copper mills of Upper Michigan. This differs little from the German revolving table, except that it has a "dead-head" at the centre from 6 to 8 feet in diameter, one-half of which is used for distributing the slime, the other half being used for clear water. The outer rim of the latter is a spiral, the surface broadening towards that point where the concentration is washed off. I have also made this rim in steps of from six to ten inches, with good results.

It may be said that this dead-head takes up a large area from the table; but this area, being immediately around the centre of the table, is of little or no value for settlement; for the current of the slime delivered at the centre is too rapid for settlement to take place until it has spread itself over an area equal to that of the dead-head, the office of which is to spread the slime moderately and evenly upon the revolving table.

In a paper read before the Institute at its last meeting in Boston, by Mr. R. P. Rothwell, it was stated that in the German dressing-works the revolving tables were being superseded by the Linkenbach fixed round buddle, for the apparent reason that the revolving tables, if over 17 feet in diameter, were expensive to build, were unwieldy, and necessitated more operations to concentrate. Some two years ago, a complete set of drawings of the Linkenbach buddle, with a set of irons for the same, were sent to the Calumet and Hecla Mining Company, with a view to their introduction, the German estimate of the cost of a single buddle being $717. A thorough examination of the drawings, with their description, and of the irons sent, compared with the practical workings, etc., of

The Evans Table,

led to the adoption of the latter for several reasons:

1. The cost of the Evans table, with only moderate facilities for its construction, will not exceed $225. The fixed buddle, with the inventor's estimate of the material and labor, at prices paid for such in this section, would cost at least four times as much, or $900. This, for the number of tables required by the Calumet and Hecla Company to properly dress its slimes, would make a difference in the first cost of $20,000.

2. The fixed buddle, with its revolving apparatus, is more complicated than the Evans table, and therefore more liable to get out of order. If there was anything to compensate for the extra cost of the fixed buddle, it would not matter; but there does not seem to be any thing. The capacity of the two machines seems to be about alike; that is, from 12 to 13 tons of slime (weighed dry) per twenty-four hours. This refers to a table 20 feet in diameter, as compared with those referred to by Mr. Rothwell, said to be about 26 feet in diameter. Comparing the capacity of the Evans table with that of the Rittinger percussion-table, per square foot of floor space taken up, the former gives 96 pounds of slimes against 50 pounds by the latter, a gain in favor of the Evans table, or round buddle, of 92 per cent. The water required by the buddle and table does not seem to vary much. Taking Mr. Rothwell's figures, the minimum, 5½ tons of slime in ten hours with 19 gallons per minute, gives about 2,100 gallons of water to the ton of sand. Experiments with the Evans table give about 2,000 gallons to the ton. There is no difficulty in making an Evans table 20 feet in diameter or more, without making it unwieldly, and at a cost specified above. Nor is there any difficulty in putting one table above another, either on the same shaft, to be driven together, or on a framework, to be driven independently; and in either case, the power to drive them is of no consequence, as the table revolves upon a steel step 1¼ inches in diameter, and a child could turn one even while loaded. With respect to the surface, those used in Upper Michigan, being made of wood, have a wood surface which works very well. One table has a canvas surface, which is said to work well for certain grades of copper. I think that the best surface for the peculiar stuff to be treated can only be determined by experiment. I understand that in Germany much experimenting has been done in this line without fixing upon any one surface suitable to all materials and conditions, marble, slate, cement, wood, rubber, canvas, etc., each having been found best under as many conditions. This holds true with respect to nearly all machines, and many a machine that is doing its best in one place is condemned in another, because it will not give as good results under varying conditions, when perhaps only a slight modification in the machine itself was needed. As well condemn the saw that will not split the board it has so easily cut in two.

As to Sizing the Material

For the table, I am not yet convinced as to the necessity for it in copper dressing. It seems to me that the necessity for it is brought about only by poor separation at the jigs. With the separators usually used, the trouble has been that if enough hydraulic is used to keep the jigs free from slime, it carries over the tail of the separator a good deal of sand that should remain on the jigs, and which is detrimental to good work on the table. This is true of all separators where the excess of the hydraulic has to pass up through a narrow aperture, through which also the mineral must fall. I suppose as much effort has been made to secure a perfect separation as in any other line in mineral washing. Many have worked with a wrong end in view, and I may add, in hydraulic separation, an impossible end; namely, a perfect sizing of the particles. Not only that, but for jigging purposes, a perfect sizing is not desirable, especially with the coarser sands; but as this is not within the province of slime treatment, I will not stop to discuss it.

However necessary it may be to classify the slimes before going to the tables, it is certainly necessary to first get all the slime free from the sand that should remain on the jigs. I am glad to announce that this has at last been accomplished with the separator recently adopted by the Calumet and Hecla Company, and secured by letters patent. In the usual method of washing and separation, where the mineral has to drop through a narrow aperture, against a rapid and direct current of water, if the current is strong enough to keep back the heaviest particles of slime, it will also keep back the lighter particles of sand, suitable only for the jigs. Moreover, a great deal of the slime clings to the larger particles of the sand, and must be washed off in the separator if good work is desired. Heretofore I have seen no separator that would do this. In the new separator alluded to, the hydraulic is brought into each compartment from behind, by a pipe whose discharge is opposite to and near the spigot. Over this pipe and spigot is placed an adjustable shield which controls the hydraulic so that it reacts with a uniform current against the mineral seeking egress through the spigot, effectually washing all the slime from the particles suitable for the jig. This process being repeated at each spigot as far as carried for the jigs, carries away the slime, leaving the jig-tails perfectly clear, while the tables reveal the fact that no sand suitable for jigging has been carried over. This is a very important part of slime treatment. These results are accomplished with from fifteen to twenty per cent less water, which very much facilitates the subsequent treatment of the slime. This separator was more fully described in a paper read before the Institute at its last meeting in Boston, by Prof. Robert H. Richards, of the Institute of Technology in Boston. The slimes of the Calumet and Hecla assay from 1.2 to 1.3 per cent, the tales of the Evans table going away at about .65 per cent—results that are very good, considering that no free copper is found in the tailings. No matter how finely subdivided these sands may be, the particles still contain a finer particle of copper.

Thanks are due to the Calumet and Hecla Mining Company, which has been so liberal in its search for the best appliances, and which has seconded the efforts of those out of whose research and experience these results have come.

Calico District.

The prospects of Calico mining district are growing brighter every day. We have kept our readers posted in regard to the individual progress of the various mines, and in this brief article will only refer to them in a general way. The appearance of the various levels in the Silver King is improving, and the value of the mine can be determined by its weekly bullion report of over $12,000. The lower tunnel of the Garfield is penetrating a large body of rich ore, and the mine is progressing close on the heels of the King, followed in the immediate rear by the Gobbler, with its treasures of chlorides and black metal. The Oriental is constantly sending ore to the mill, and has reached such a depth as to insure its being a permanent mine. The Bismarck is rolling out tons of ore of a fair grade at every blast. The Golconda, considering the amount of work done on it, is destined to rank among the principal mines of the camp. The Silver Odessa is awakening from its lethargy, and the pick and blast are opening up some rich deposits. The Mammoth, adjoining the Silver King, is reflecting some of the latter's silvery rays in its bullion yield, as well as the Oriental No. 2, adjoining the east end of the King of our mines, which is attracting considerable attention, owing to recent strikes, made at quite a depth in this mine, which has been lying idle so long. The other mines that are in operation are looking well, and the general outlook of the camp is such as to encourage everybody. We could enumerate a number of mines that will be in operation ere long, but will simply refer to the Burning Moscow, Red Jacket, Humbug, Exchequer, O. K., and Dragons. These mines stand as good a show to open up rich deposits as any in the camp, and most of them have already turned out considerable quantities of ore. There are many undeveloped claims in the camp that may yet prove to be permanent paying mines when they are properly opened up. Taking everything in consideration, the present and future outlook of Calico mines is very encouraging. Before the fires destroyed the business portion of the town, the business men had the fullest confidence in the stability of the camp. Even when their business places were in ashes their confidence was not shaken, for it was not long before as many buildings were erected as were destroyed by fire. The town is now looking substantial, lively and prosperous, and we can safely predict stirring times here this fall and winter. Calico's colors are not the kind that easily fade. *Calico Print.*

A Nickel Discovery.

It has long been known to intelligent prospectors in this section that nickel is associated with other metals in the metalliferous veins traversing the metamorphosed granite, quartz-diorite and slate belt (from three to seven miles in width) separating the quartz-porphyry that skirts the volcanic valley of Mono Lake from the hornblendic or syenitic granite constituting the summit of the Sierra Nevada chain, and extending from Green Creek, north of Castle Peak, to the North Fork of Rush Creek, south of Mount Lyell, a distance of twenty-five miles or more. Float rock carrying from eight and a half to nine and a quarter per cent of nickel, $15 to $18 per ton in silver, and a trace of gold, has been found in considerable quantities on Virginia Creek, near the base of Castle Peak, and it was probably the presence of a large percentage of nickel that prevented the successful working of the rich auriferous ores of the Dunderberg mine, at the northern base of that peak, years ago. In some places along the outcrop of the Sheepherder lode of the Great Sierra Company, on Tioga Hill, twelve miles further south, where the slate has displaced the granite of the summit and crossed diagonally over to the western slope, nickel is also found in considerable quantities, but the shaft sunk over the tunnel shows that it does not follow the vein down more than forty feet. An occasional trace of this metal is also found in the free-gold ores of this district. Andrew Thompson and John Hall have recently made a discovery on Iron (or White Wolf) Mountain, five miles south of Tioga Hill, which bids fair to prove the *veta madre* of nickel in this section. They sunk down in the solid vein about fifteen feet, and crosscut fourteen feet without finding any traces of either wall. The lode is on a gentle slope of a low slate mountain, the surface of which was polished by the glacier which moved northward from Mount Lyell and eroded the canyon or valley now occupied by the Dana Fork of the Tuolumne, but this surface has since weathered until it is covered with sufficient soil to support a heavy forest of pine, and hence the outlines of the lode can not be traced on the surface, but the indications are that it is sixty feet wide. So far as the vein has been opened, the ore appears to be of very uniform grade, except a few small streaks of barren quartz and an average sample sent to San Francisco for analysis gave a return of thirty-four per cent nickel, $17 per ton in silver, and a trace of gold. When run out by the recent storm, the owners were not aware of either the nature or the value of their discovery, as they did not get returns from the assayer until they came in, but were drilling away through the "iron" in search of silver.—*Homer Index.*

Perils and Pleasures of the Botanist

A reception tendered to the well-known botonists Prof. and Mrs. J. G. Lemmon, at the Harmon Seminary, on the evening of Oct. 16th, was a great success, and was highly enjoyed by all present. The large audience room of the Seminary was well filled, and the excellent addresses by Prof. and Mrs. Lemmon, with musical selection by several of the pupils of the institution, made the evening seem very short. The guests of the evening were in good heart and voice, and they talked in an informal manner of their botanical researches and the results thereof. They described the topography of Arizona, and the peculiar forms of vegetation met with, with an abundance of specimens, and with beautiful water-color sketches, made by Mrs. Lemmon, of various plants as they were found growing. Certainly all who heard went away with new ideas of the great wonderland to the southeast of us. The speakers carried their audience through the plains of mesquite and the almost impenetrable fastnesses of cacti, and showed them the most beautiful flowers and ferns, which they found growing in great abundance in certain situations. It was apparent that our botanists had reaped a perfect harvest of plants new to science, and thus have made most valuable contributions to our knowledge of the flora of the territory. The educational value of their addresses to the young ladies of the Seminary, and to their invited guests, it would be hard to overestimate, and we are glad to know, from the expressions of those who were present, that Prof. and Mrs. Lemmon won for themselves places of honor in the esteem of many, and that the appreciation of their brave and devoted work will be greatly extended by their appearance on the occasion we have described.

NEW ROCK DRILL.—The Nevada *Herald* says: One of the best inventions in the way of mining appliances that has ever been invented in this county is the rock drill patented by Messrs. George F. Emory and Charles Barlow, of this place. The machine can be run either by steam, compressed air, or water power. * * * Many improvements have been made in the Emory & Barlow drill since we last mentioned it in these columns. Two or three slight obstacles which presented themselves have been removed, and the little machine now works like a charm. The drill is struck by a regular sledge hammer, which is fitted upon an iron handle, the operation of the machine causing the hammer to hit the end of the drill with great force and rapidity. When running at full speed the hammer strikes 350 blows a minute. A chain belt fits over projections on the drill collar, and by its continuous motion causes the drill to turn slightly at each blow. The rock dust is washed from the drill hole by a small jet of water, which is kept running constantly while the drill is working. One horse-power will run the drill, and it can be successfully operated by a small water-wheel, with a pressure of 150 feet. Lawrence & Barlow, at their foundry on Sacramento street, near the depot, have one of the machines set up in the yard, against a large granite boulder, where interested persons can see the practical working of it. They use a small hurdy wheel to run it, getting water pressure by means of a steam pump.

NEW ALMADEN MINES.—The quicksilver mines at New Almaden are turning out large quantities of ore at the present time. Five hundred and fifteen men are kept fully occupied, working ten hours per day. The majority of them are Englishmen, and the balance are Mexicans and Chilenos, and a few Chinese. Miners are paid from $2 to $2.40, and surface men from $1.50 to $2 per day. Out of these wages single men have to pay 75 cents per day for board, and $3 to $6 per month for lodging. Married men have houses to live in, but have to pay rent. There is a Catholic and also a Methodist church on the hill, a handsome schoolhouse, and a commodious hall for amusements. Four shafts are worked, the lowest at a depth of 2,000 or 3,000 feet below the level of the sea; and there are estimated to be fifty miles of underground drifts, all well timbered and ventilated; and the system of water supply is most complete. This is conveyed from a neighboring mountain, by means of a 2½ inch pipe, at the rate of 30 gallons per minute.

MECHANICAL PROGRESS.

Metallic Cars.

Since the close of the Chicago Exposition, certain of our contempories have been blaming master car-builders for their conservatism or lack of enterprise in not having exhibited for public inspection cars made of iron or steel. The Master Car-Builders' Association also comes in for a share of reprehension in not urging forward with energy and zeal the change from wood to metal. The claim is advanced that iron or steel will be used in car construction at no distant day, even from the humble coal car to the luxurious drawing-room coach. When the interests or prejudices of people lead them to desire a change in any practice or principle, they do not generally search long before finding plausible reasons for demanding what will satisfy their wishes. The iron and steel advocates are at this time solicitous for the safety of passengers, and they can not perceive any means whereby travel can be rendered safe except by the employment of steel cars.

There are two sides to this question. Lumber dealers are probably interested in retaining the present practice, and it may be that those who take the lead in pressing upon railroad companies the desirability of abandoning wood as a building material may by self-interest be biased in favor of steel or iron. But if there is any class concerned in this matter which ought to be neutral, it is the master car-builders employed by the various railroad companies. Their interest is in the best, the s f st, and consequently the cheapest, material for cars, irrespective of whence it came and of what it may be composed. Nothing that has yet been accomplished by iron or steel in the way of car building indicates any superiority over wood or even paper for general utility; and we certainly think the Car-Builders' Association acted wisely in refraining from pledging their influence in favor of a change which is yet experimental. There will be nothing lost by waiting till investigation and experiment prove what is really most suitable as a substitute for wood when that material becomes so scarce that it can no longer be used economically in car construction.

Only in one respect can the friends of steel make a decided point for that material over wood, and that is, its immunity from taking fire in case of accident. We believe this danger from fire is exaggerated, for where the floors of a car are filled with a non-combustible substance, and safety stoves and lamps are used, the chances of a car taking fire are very remote. Metallic cars would not be absolutely free from this danger, as the lining would necessarily be of wood. As a car-building material, iron or steel has certain objectionable features which must not be overlooked. In summer, metallic cars would have a tendency to be intolerably hot, for no amount of non-conducting material could prevent the heat of the sheets from being conveyed inside the car. In winter, on the other hand, the temperature of the metal would always be lower than the air inside the car, and continual sweating would ensue, with all the discomforts of dampness and water-saturated lining. This condition of affairs would be calculated to reduce the life of a steel car considerably below the period usually calculated on. There is another objection to metallic cars, which will occur to any one who has traveled on an empty tender; that is, the noise produced by the vibration of the iron sheets. Means of deadening this discomforting sound could probably be devised, but years of patient labor and experiment to overcome this and other objectionable attributes are required before the metallic car can be considered ready to fulfill its promised mission of superseding the wooden car.

We do not believe that there will be any sudden revolution in car-building. As lumber becomes scarcer and more expensive, metal, and perhaps paper, may be worked in gradually, the tools and building appliances being changed by degrees to meet the new conditions. Iron and steel have already worked into favor for trucks, but the adoption of metal has been a slow process, every step being accomplished after experiments made to ascertain the best methods of using it. Iron or steel sills may be the next step in progress, and other parts will follow on the metallic base when that becomes the cheapest medium; but we do not anticipate seeing the body of passenger coaches made of a material which conducts heat and cold so readily as does iron or steel.—*National Car Builder.*

FORGING BY PRESSURE.—The Collins Company, Collinsville, Connecticut, make the adz-shaped heads of pickaxes by pressure instead of by percussion. A square bar of Norway iron, one and three-eighths inch diameter, is heated to a softening red-heat, placed between clamping jaws, forming a matrix of the shape and dimensions of the ax head; and a punch, propelled by an eccentric and lever, moves forward and forces the iron into the mold or matrix, the punch being the size and shape of the handle hole. The action of the punch, or movable die, is not rapid; no more so than the movement of ordinary punching presses or cutting shears for boiler plate: it is a pushing or pressing movement, and in no sense a blow. The effect, however, is to form from the inch and three-eighths bar a head two and a half inches deep, with a lozenge-shaped eye three by one and an eighth inch. The longitudinal fibers of the iron are not broken, but are bent so as to follow the contour of the projecting portion of the head. The advantages of this method, in this instance, are that no appreciable portion of the iron is wasted by forging down from a wide bar and punching the eye from the solid—a saving of labor, and a gain of strength by preserving the continuity of the fibers of the iron. There may be many other instances in which the forging by pressure would be preferable to forging by percussion. —*Scientific American.*

Vibration of Bridges.

At a recent meeting, in New York, of the American Society of Civil Engineers, a paper, by James L. Randolph, Chief Engineer of the Baltimore and Ohio railroad, upon "Vibration, or the Effect of Passing Trains on Iron Bridges, Masonry, and other Structures," was read. Mr. Randolph refers to the fact that double-track bridges are moved in the direction of passing trains, and are consequently twisted, and strains are produced not provided for. Also that cattle-stops and open culverts, where built of rubble-work, have the walls shaken to pieces by vibration.

The remedy he has supplied for these culverts and stops has been to build them of large stone, as nearly the same size as possible. The tall, thin bridge piers and abutments on which iron bridges rest, have their stones so much disarranged by vibration as to make it necessary to secure them with timber and iron straps. Iron bridges resting on stone pedestals vibrate in this manner, and receive a return blow from the vibration of the pedestal, particularly if the pedestal is a light structure; but, as the iron and the stone do not vibrate in the same period, there must be time when the result is a movement in the direction of the force. The effect of this vibration has been particularly noticeable at the Harper's Ferry bridge, where there was a movement of four inches in four years. After the insertion of planks between the stone and iron, this movement ceased. Where the masonry of piers has a platform of timber between its foundation and solid rock, no displacement of stone has been noticed. Mr. Randolph contends that a monolith would be the best support for structures subject to vibration caused by strains, but that a monolith of the specific gravity of granite would give a damaging return blow. Timber would answer the purpose, but it is perishable. The material which, in his opinion, is most serviceable is an artificial stone, which is about two-thirds the weight of granite, is compact, durable, and with very little elasticity.

A CONVENIENT BOILER TEST.—A correspondent of the *Mechanical Engineer* gives the following method of testing a boiler, which, though not novel, is good: Fill the boiler full of water until it stands over the safety-valve seat. Be sure the valve fits tight to its seat, and works free. Then calculate the area of the valve, weight it to raise at the pressure you wish to test, and start a moderate fire under the boiler; the expansion of the water will raise the valve when the pressure reaches the test point; that is, if the boiler will stand it. If it will not, it will give way slightly in the weakest place, without doing any further damage; for if the test is properly done, the water will not be near the boiling point. To set the valve to test, say at 200 pounds per square inch, proceed as follows: Length of lever is 21 inches, distance of valve from fulcrum 3 inches, area of valve 4.9 inches. Then $21 \div 3 = 7$, $200 \times 4.9 = 980$, and $980 \div 7 = 140$ pounds, to be placed on the end of lever. From this, however, the weight of lever, valve and stem should be subtracted.

BOILER EXPLOSIONS.—Several of our exchanges have been enlightening an ignorant world concerning the cause of boiler explosions. One journal asserts that one of the most common causes of explosions is the practice of blowing out a boiler and then refilling it with cold water while the sheets and surrounding brickwork are very hot. That a boiler may explode from this cause, we will not deny, but that it is one of the most common causes of explosions, borders closely on exaggeration. We are more inclined to believe that the majority of boiler explosions are caused by carelessness, allowing the water to get low, and generating a pressure too great for boiler rivets to stand. There are so many ways by which an insufficient water supply may be caused, that we do not care to discuss them here.—*Wood Worker.*

DIFFERENCE IN DIAMETER OF HOT AND COLD CYLINDERS.—No mention has ever been made, says an exchange, of the difference in diameter between the cylinder of a steam engine hot and the same when cold. In small engines this change of dimension would not be great, but in large ones, and with the high pressures now carried, it can not be ignored. A cylinder 72 inches in diameter has 4,072 square inches area. Supposing it to expand only one-eighth of an inch, which is quite within bounds, it is then 4,085 inches in area, or 13 square inches larger. When this is converted into foot-pounds and pressures, it represents an item of no small importance. Since all calculations are made upon the basis of the board diameter, it follows that it can not be correct, and that the power is greater by the amount of the relative expansions in the cylinder diameter at extremes of temperature. A thorough study of the matter would be of great interest, and there is no doubt great truth in the remarks.

SCIENTIFIC PROGRESS.

Electricity on Railways.

One of the chief problems on which the inventive genius of the world is now expending its resources is the application of electricity to railroad transportation. For forty years experiments have been conducted with electric motors of all shapes, sizes and degrees of complexity; and there is now an excellent prospect for the substitution of electricity for steam on railways where either a low or high rate of motion is required. As many as 150 miles of electric railway are in operation in Europe; electric cars have recently made the circuit of Paris; an engine designed by an electrician to take the place of the ordinary locomotive was the most conspicuous triumph of American inventive skill at the Railway Exposition in Chicago not long ago; and in the vicinity of New York active preparations are making by rival inventors and corporations to introduce electricity on a large scale as a safe, rapid and cheap motor.

The electric car which recently traversed the streets of the French capital covered a distance of thirty miles in three hours. It was an ordinary street car, running in the regular tramways. The power was stored in Faure accumulators, placed under the seats, and was communicated to a Siemens machine, under the floor. This machine, making 2,200 revolutions a minute, brought the power to bear upon the wheels by means of pulley, axle and chains. The car was completely under the operator's control, and could be stopped instantaneously. The highest velocity attained did not exceed ten miles an hour on level ground, but the inventor contended that a much greater rate of speed could be obtained on rails especially adapted to the car. The cost of operating the motor was estimated at one-half that of ordinary horse cars.

The Siemens electric railway system in Berlin was operated on a different principle. The electric current was communicated from the rails to the motor. The rails were insulated, and the use of a wire was required overhead.

The new electric railway recently opened on the Irish coast, between Portrush and the Giant's Causeway, is a marked improvement upon the Berlin experiment. This system brings into use a separate conducting rail, carried at a height of seventeen inches from the ground, on wooden posts. The railway is operated at a decreased cost in comparison with steam, and a fair rate of speed is easily secured.

Experiments made a few weeks ago, however, with the Daft electric motor, in Greenville, N. J., give promise of greater results in the future. The electric current is transmitted to the rails from stationary engines, as in the case of the Berlin railway, but is so low in tension that there is no danger from contact either to man or beast. It is not even necessary to insulate the rails. The current is communicated from the wheels to the machinery which operates the motor, and notwithstanding the lack of insulation, a high rate of speed is practicable. If the statements in regard to the velocity, cost of working and general utility of these motors are confirmed by practical experience, a great revolution in railway transportation and steam-car traffic can not long be deferred.—*N. Y. Tribune.*

Problem of the Universe.

If asked, says Professor Tyndall, whether science has solved or is in our day likely to solve the problem of the universe, I must shake my head in doubt. Behind, above and around us the real mystery of the universe lies unsolved, and as far as we are concerned, is incapable of solution. The problem of the connection of the body and the soul is as insoluble in its modern form as it was in the pre-scientific ages. There ought to be a clear distinction made between science in the state of hypothesis and science in the state of fact; and inasmuch as it is still in its hypothetical stage, the ban of exclusion ought to fall upon the theory of evolution.

Professor C. A. Young, while speaking upon the same problem, in a late astronomic lecture, said: "Do not understand me at all as saying there is no mystery about the planets' motion. There is just one single mystery—gravitation: and it is a very profound one. How it is that an atom of matter can attract another atom, no matter how great the disturbance, no matter what intervening substance there may be; how it will act upon it, or at least behave as if it acted upon it, I do not know, I can not tell. Whether they are pushed together by means of an intervening ether, or what is the action, I can not understand. It stands with me along with the fact that when I will my arm to rise it rises. It is inscrutable. All the explanations that have been given of it seems to me merely to darken counsel with words and no understanding. They do not remove the difficulty at all. If I were to say what I really believe, it would be that the motion of the spheres of the material universe stand in some such relation to Him in whom all things exist, the ever present and omnipotent God, as the motions of my body do to my will—I do not know how, and never expect to know."

Rapidity of Cerebral Acts.

M. Albert Rene has, according to the *Revue Scientifique*, made a long series of experiments in the physiological laboratory of the Faculty of Medicine at Nancy, on the rapidity of transmission of impulses through nerves, and the rapidity with which cerebral acts are performed. He finds that the intensity of the stimulus has a direct influence on the rapidity of nervous transmission. The stronger the stimulus the more rapid the transmission. The rate of transmission can not therefore be stated in exact terms, since it is relative, as has been not unfrequently noted for other kinds of cellular activity. He has also confirmed the fact, now very generally admitted, that it is impossible to measure the rapidity of transmission in sensory nerves by stimulating different points of their length, for the rapidity of the response is not proportionate to the length of the nerve traversed. Thus the response to a stimulus applied to the fingers is often made with a shorter interval of time than a stimulus applied to the elbow or to the shoulder, though the length of nerve called into play is much greater in one place than in the other. In a word, it is impossible to compare the results obtained from different regions. The most exact method of measuring the nervous transmission appears to be that of response to an auditory stimulus. The rapidity with which nervous impulses are here conducted he estimates at 28 meters per second, which is a little lower than the number obtained by other physiologists. For the rapidity of transmission of motor impulses, M. Rene gives 20 meters per second, which is below that of experimenters, and notably below that of M. Chauveau. The duration of a cerebral act he estimates at .035 second. In young infants the duration is more considerable, amounting to .09 second. The duration of a reflex act, that is to say, the time occupied by the entire reflex arc, sensation, transmission to the cord, including motor impulse and muscular movement, is .15 second.

CONVERSION OF LIGHT INTO ELECTRICITY.—The production of light from electricity is so well known that it may have seemed singular that light would not generate electricity. The latter has actually been accomplished by Sauer, who has constructed a battery that acts only in sunlight. In this case it is the chemical constituent of the light that furnishes the power. Heat rays acting upon a thermo pile also produce a current. Sauer's battery consists of a glass vessel containing a solution of 15 parts of table salt and 7 parts of sulphate of copper in 106 parts of water. Within is a porous cell containing mercury. One electrode is made of platinum, and is put in the mercury; the other is of sulphide of silver, and is placed in the salt solution. Both are connected with a galvanometer, and the whole is inclosed in a box, when not in use. When the battery is placed in the sunlight, the galvanometer needle is deflected to a certain point, and the sulphide of silver is found to be the negative pole. Any change in the intensity of the light, such as a cloud over the sun, is indicated by the needle. The action of the battery depends upon the effect of the chloride of copper upon the mercury. Subchloride is formed, and reduces the sulphide of silver, but this can only take place with the aid of sunlight. Hitherto the only manner in which light seemed to affect electrical action was by increasing the resistance of a selenium cell, and all photo-electrical experiments were based on this phenomenon.

VITALITY OF DRIED WILLOW GERMS.—A correspondent of the *Scientific American* furnishes that journal with the following: During the summer of 1853, Silvester Piper, now a resident of 3526 Jones street, Chicago, called my attention to a willow basket, in a ditch, which had sprouts several inches in length all around it. A curiosity so remarkable—possibly having no parallel—led me to take immediate steps for its preservation. I dug the basket up with the greatest care, and found it to be a worn-out castaway, which had done service as a basket until it had become so badly worn as to render it worthless, when it found its way into a ditch at the base of the bank of the Illinois and Michigan canal, about 300 feet from the Bridgeport lock (now within the city), from whence I transplanted it with great care, placing it in a wet place in my father's garden; but, notwithstanding its former vitality and careful removal, the shock was too great for the tender shoots, and they all died. The basket was made wholly or in part of unpeeled willow, whose dried and withered germs needed only the opportunity to return to life. I have often resolved to have the story of the 'willow basket' written and placed upon record, while there were still living other witnesses than myself to verify it.

SOLIDIFIED BISULPHIDE OF CARBON.—According to M. Mercier, by mixing boiled linseed oil with 10 per cent of protochloride of sulphur, a gelatinous mass is formed, and if a large quantity of bisulphide of carbon be simultaneously added, the whole sets into an elastic transparent jelly, very permanent in the air, and inflammable only with difficulty, although it may contain as much as 70 per cent of the bisulphide.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELIN'QT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Best & Belcher M Co	Nevada	27	50	Sept 18	Oct 24	Nov 16	William Willis	309 Montgomery st
California M Co	Nevada	9	20	Oct 1	Nov 7	Dec 5	C P Gordon	309 California st
Champion M Co	California	13	10	Oct 8	Nov 15	Dec 8	Theo Wetzel	522 Montgomery st
Con Amador M Co	Nevada	6	50	Sept 15	Oct 20	Nov 13	F B Latham	408 California st
Campo Seco Copper Co	California	2	10	Aug 10	Oct 1	Nov 20	D Buck	309 Montgomery st
Day S M Co	Nevada	13	30	Sept 7	Oct 15	Nov 12	E M Hall	327 Pine st
Elko Con M Co	Nevada	2	15	Oct 6	Nov 12	Dec 4	F Sperling	309 California st
Eureka Con M Co	Nevada	7	10	Sept 27	Nov 10	Nov 30	A F Main	418 Jackson st
Eintracht Gravel M Co	California	13	05	Sept 11	Oct 17	Nov 5	H Kunz	209 Sansome st
Eureka Con M Co	Nevada	6	1.00	Sept 23	Oct 22	Nov 12	P Jacobus	309 Montgomery st
Gorilla M & M Co	California	2	21	Aug 23	Oct 3	Oct 31	A A Enquist	436 Montgomery st
Hale & Norcross M Co	Nevada	78	50	Sept 11	Oct 16	Nov 6	J T Lightner	309 Montgomery st
Mayflower M Co	California	20	15	Oct 4	Nov 6	Nov 22	J Morizio	328 Montgomery st
Martin White M Co	Nevada	16	25	Sept 22	Nov 7	Dec 6	J J Scoville	309 Montgomery st
Mexican M Co	Nevada	24	1.00	Sept 17	Oct 23	Nov 13	C L McCoy	309 Montgomery st
Pleasant Valley M Co	California	2	15	Sept 8	Oct 16	Nov 3	C E Elliott	327 Pine st
Ruby Hill Gravel M Co	California	9	25	Sept 3	Oct 20	Nov 12	H Pecham	329 Sansome st
Silver Hill M Co	Nevada	19	05	Sept 3	Oct 8	Oct 30	W E Dean	309 Montgomery st
Trinity G M Co	California	1		Sept 15	Oct 22	Nov 6	L Wadham	523 California st
Union Con M Co	Nevada	24	50	Oct 15	Nov 20	Dec 11	J M Buttington	309 California st
Utah S M Co	Nevada	46	1.00	Oct 11	Nov 16	Dec 11	G G Pratt	309 Montgomery st
Winthrop M Co	California	1	25	Sept 17	Oct 23	Nov 16	H Wright	410 Front st
Yaqui M Co	Mexico	2	10	Sept 12	Oct 17	Nov 7	T T Atkinson	337 Pine st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
East Mt Diablo M Co	California	G W Fisher	306 Pine st	Annual	Nov 7
Gold Lead M Co	California	J Bronza	328 Montgomery st	Annual	Nov 2
Trinity G M Co	California	L Wadhan	523 California st	Annual	Nov 5

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Bulwer Con M Co	California	W Willis	309 Montgomery st	15	July 2
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	July 19
Mt Diablo M Co	Nevada	R W Heath	318 Pine st	25	Oct 25
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	Oct 12
Silver King M Co	Arizona	J Nash	315 California st	25	July 12

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Oct. 3.		WEEK ENDING Oct. 10.		WEEK ENDING Oct. 17.		WEEK ENDING Oct. 24.	
Alpha	2 25		2.25	2.10	2.50	2.10	2.15	
Alta	1.25	1.60	1.30	1.40	1.40	1.60	1.25	1.55
Andes	.50	.55	.55	.60	.55	.60		.55
Albion			.35	.40				
Argenta			.20	.25	.15	.40	.15	.20
Atlas								
Belcher	1.05	1.10	1.15	1.35	1.20	1.45	1.10	1.25
Belding								
Best & Belcher	3.05	3.20	3.15	3.30	3.10	3.50	3.65	4.00
Bullion	.75	.80		.85	.80	1.00		.90
Bechtel								
Belle Isle		.30			.40	.50	.40	.50
Bodie Con	.50	.60	.50	.55	.40	.70	.50	.65
Benton	.20	.25			.20	.25	.15	.20
Baltic Tunnel								
Caledonia								.15
California	.10	.15	.15	.20	.15	.20	.10	.20
Challenge		.35				.35		.35
Chollar	2.25	2.80	2.65	2.95	2.20	3.00	2.25	2.70
Confidence		1.60	1.85	1.90			1.60	1.75
Con Imperial				.10				
Con. Virginia	.40	.45	.45	.50	.50	.60	.45	.60
Crown Point	1.10	1.30	1.30	1 45	1.20	1.40	1.20	1.30
Day		.20		.35				
Elko Con	.10	.15		.10				
Eureka Con	6.25	7.00	6	6.00	4.50	5.00	4.25	5.00
Eureka Tunnel		.10		.10		.15		.10
Exchequer	.50	.60	.55	.65	.50	.65	.40	.55
Grand Prize		.20	.25	.60	.50	.55	.50	.55
Gould & Curry	2.25	2 35	2.20	2.40	2.10	2.35	1.75	2.35
Hale & Norcross	3.25	3.70	3.50	4.00	2.25	3.85	2.30	2.60
Holmes								
Independence							.40	.45
Julia						.05		
Justice	.40	.55	.50	.45	.40	.45	.25	.40
Jackson								
Kentuck								
Martin White								
Mono								
Mexican	2.15	2.35	2.25	2.50	2.25	2.70	3.20	3.50
Mt. Diablo				.25	4.00	4.50		4.00
Mt. Potosi								
Noonday								
Northern Belle	5.75	5		5.00	5.00	5	4.00	4.25
North Noonday								
Navajo		2.60	2.70	3	3.25	4.50	4.10	4.80
North Belle Isle			.40	.50	.40	.70	.60	.65
Occidental				1.50	1.50	1.60	1.10	1.50
Ophir	3.25	3.45	3.60	4.70	4.55	6.75	5.50	5
Overman		.35	.35	.40		.40	.35	.40
Oro								
Potosi	.85	1.05	.95	1.15	.90	1.15	.90	1.05
Pinal Con								
Savage	1.40	1.70	1.45	1.55	1.10	1.50	1.00	1.25
Sug. Belcher								
Sierra Nevada	3.40	3.70	3.95	4.35	4.15	4.60	3.65	4.25
Silver Hill								.10
Silver King		7.25						7.50
Scorpion	.50	.60	.55	.60	.60	.65	.50	.60
Tuscarora								
Union Con	3.80		4.00	3.80	4.40	3.85	4.20	3.50 3.90
Utah	1.80	2.40	1.90	2.10	1.90	2.40	1.60	1.90
Ward								
Wales								
Yellow Jacket	3.05	3.20	3.20	3.65	3.25	4.00	3.15	3.40

Sales at San Francisco Stock Exchange.

THURSD. A. M., Oct. 25.

400	Alta	1.40	
250	Andes	.55c	
300	Argenta	.15c	
200	B. & Belcher	3.70@3.75	
100	Bullion	.65c	
100	Belle Isle	.35c	
100	Benton	.20c	
150	Bulwer	.75c	
240	Chollar	2.45	
25	Crown Point	1.20	
210	Con. Virginia	.50c	
800	California	.10c	
700	Exchequer	.45@.50c	
50	Eureka Con	3.25	
460	Gould & Curry	1.85@1.90	
200	Grand Prize	.55c	
470	Hale & Nor	2.35@2.40	
150	Jackson	.20c	
200	Lady Wash	.05c	
100	Navajo	.3	
50	Northern Belle	.4	
165	Ophir	.5	
475	Sierra Nevada	3.90	
200	Scopion	.50@55c	
140	Utah	1.85	
275	Union	3.70	
50	Yellow Jacket	3.35	

AFTERNOON SESSION.

130	Alta	1.25	
180	B. & Belcher	3.65@3.70	
150	Belmont	1.75	
100	Benton Con	.15c	
380	Chollar	2.45	
150	California	.10c	
100	Caledonia	.15c	
370	Exchequer	.40@.45c	
170	Gould & Curry	.15	
1280	Hale & Nor	2.30@2.35	
200	Justice	.25c	
250	Mexican	3.20	
10	Navajo	3.65	
540	Potosi	.90	
50	Scorpion	.50c	
50	Savage	1	
625	Sierra Nevada	3.65@3.70	
100	Utah	1.65	
695	Union Con	3.6@3.60	

Bullion Shipments.

Mt. Diablo, Oct. 18th, $10,697; Hanauer, 16th, $5,000; Ontario, 16th, $15,328; Bullionville, 16th, $2,240; Horn Silver, 16th, $21,000; Horn Silver, 17th, $4,000; Bullionville, 17th, $2,277; Alice, 17th, $11,212; Hanauer, 18th, $10,200; Crescent, 18th, $2,100; Ontario, 18th, $10,708; Horn Silver, 18th, $12,000; Stormont, 19th, $2,990; Hanauer, 19th, $3,620; Ontario, 19th, $5,267; Horn Silver, 19th, $12,000; Ontario, 20th, $4,968; Ontario, 21st, $7,767; Horn Silver, 21st, $12,000; Contention Con., 20th, $16,206. During the week ending Saturday, October 20th, there was shipped from Salt Lake 47 cars of bullion, 1,200,983 pounds; one car antimony ore, 20,000 pounds; one car lead pipe, 30,445 pounds; 2,040 pounds granulated lead; making a grand total of 59 cars, aggregating 1,563,558 pounds.

Our Patent Department.

The MINING AND SCIENTIFIC PRESS Patent Ageney of Dewey & Co. is not oniy the oldest established one on this coast, bnt the most extensive in every respect. The managers have had an experienee of over 20 years in obtaining United States and foreign patents for Pacific Coast inventors, for whom some thousands of patents have been taken out. The large library of Patent Office reports is supplemented by a good one of other works useful to nventors; and in addition there are full and complete specifications and drawings of every patent taken out in the United States since 1871. The clientage of this patent ageney embraces all the most prominent inventors on the coast, who appreciate its advantages for prompt and intelligent work, and honorable, fair dealing.

As this patent ageney has been in existence so many years, it has among its archives a great mass of information, which is utilized for the benefit of its patrons. In certain branches, particularly, the information we possess is very valnable to inventors, notably in mining machinery, metallurgical applianees, cable railroad apparatus, agricultural machinery, etc. With experienced draftsmen and specification writers, we are enabled to transact the business of inventors with intelligent skill, and greatly to their advantage. This patent agency is in no manner connected with the sale of patents or patent articles, being thereby entirely free to give faithful and unbiased services to its elients.

Mining Share Market.

No unusual activity has been shown of late, except in Ophir and Hale and Norcross. The former was due to a contest for control. In the Hale and Norcross great improvement has been shown on the north drift on the 2700 level. The quartz is the best yet found. Interspersed through it are small, irregular lumps or pebbles of porphyry. These are the same as have heretofore been seen in all the Comstock ore bodies. In the California and Consolidated Virginia bonanza these lumps of porphyry ranged in size from the diameter of peas to bowlders several hundred pounds in weight. The quartz now found is very different in appearance from that seen in the stringers and feeders heretofore met with. It shows strength and indicates bulk. In this quartz spots of black sulphuret ore are beginning to make their appearance. Just how wide the vein of quartz is remains to be ascertained.

On the 3000 level of the Union Consolidated they have discontinued work for a time in the west cross-cut, and are now driving a cross-cut east into ground thus far wholly unexplored.

At the Ophir they are finding some old fillings on the 150 level which will pay for milling, but not much of value has yet been found in the new ground. The level has heretofore been pretty thoroughly explored, it would seem, at various times.

At the Imperial the 600 station is completed, and they are now preparing to start a drift west to tap the old upper levels.

Although considerable work is being done in the Gold Hill mines, the extraction of ore can not be fully resumed till the mills start up.

In case no accident shall occur, the Alta mine will now soon be drained, when work on the lower levels may be fully resumed.

REMEMBER, if you want health and strength of mind and muscle, use Brown's Iron Bitters.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

VOLCANO.—Cor. *Dispatch*, Oct. 20: The Downs mine is running by day in the old shafts, retimbering and taking out rock until they can get water enough to start the mill. The Canvin mine is looking well. They are taking very rich rock out, and have plenty of it in sight. The ledge is 4 ft wide and averages $25 to the ton. They have finished running levels. There is about 75 tons on the dump ready for crushing. We have been to see Gillick & Phillip's mine. We found the gentlemen getting out rich rock. The ledge is 4 ft wide. The have it stripped for 75 ft, ready for stoping, and have about 70 tons at the mill ready for crushing when the rain comes. J. E. Doolittle, Supt. for the Tunnel Co., has completed the new flumes and wing-dams, and is now prepared for rains.

PLYMOUTH.—The mines here never paid any better than at present. The water will be brought to the Empire mill with several hundred feet more fall, and the mill will hum away with her 80 stamps every month in the year.

NOTES.—*Ledger*, Oct. 20: The big tunnel at Middle Bar is in about 100 ft. They are now in softer rock, and progress will be more rapid if the water supply holds out. It is expected that the water will be turned into the new pipe across Jackson Creek next Saturday. The Loyal Lead mine is said to be turning out well under the management of John Palmer and his co-owners.

Calaveras.

GOLD CLIFF MINE.—Sonora *Democrat*, Oct. 20: Some most remarkable results in mining are being achieved at the Gold Cliff mine, at Angels camp, Calaveras County. The mine is on what is generally known as the "mother vein," but the lead itself is not worked. It is from a belt of slate running parallel with the lode that the gold comes. At the Gold Cliff this belt is over 100 ft wide. Every thing within this distance is taken out and run through the mill. The rock is simply quarried out from the surface along the hillside. The gold is all sulphuret gold, and is very fine. All along the surface and for some depth below the surface the sulphurets are oxidized and decomposed, which renders the gold easily saved. One hundred tons of ore, if the stuff can be called ore, is put through a 20-stamp mill every 24 hours. Although the power used is steam, the total cost of mining and milling is only one dollar per ton. Mr. Goldstone, the Supt., informed the *Democrat* that the mine pays regular dividends.

El Dorado.

GREENWOOD.—Cor. Placerville *Democrat*, Oct. 20: Mr. A. J. Morrell has recommenced work on the Morrell Con., having run a tunnel to tap the ledge at a distance of 50 ft below the golden discovery recently made. The work will be completed at an early date. The ledge matter at the present working is 2 ft thick, and is very rich. This pay vein has been followed to a depth of 40 ft. It has invariably paid for working by a hand mortar, never paying less than $4 a day to the hand. The upper tunnel, in which the last work was done before the sale, having caved in, it became necessary either to run a new tunnel or put in a good pump. The owners, now feeling able to make so much of an outlay, sold it to Mr. Morrell.

SPRINGFIELD.—The Springfield mine is running with a full force, and work was resumed on the new shaft Tuesday. The new machinery is first-class. Everything about it works like clock-work. The hoisting machinery being erected on the Lamoille mine is nearing completion, and Supt. Long informs me that every thing will be in running order in a few days.

STRUCK IT.—On Thursday last Fred Benfeldt struck a fine bed of gravel in his mine near Smith's Flat. It was only last Saturday that Fred expressed himself as discouraged. During the cold weather last winter the mine was shut down and allowed to fill with water. This caused numerous caves, and it has taken constant work during the entire summer to repair damages.

THE GRAND VICTORY MINE.—C. A. D. Gray, Supt. of this mine, near Diamond Springs, was in Placerville Thursday. Mr. Gray informs us that he is keeping 35 of the 50 stamps in his mill at work right along on good ore, and that by the first of next month he will start up the other 15.

THAT PULVERIZER.—Georgetown *Gazette*, Oct. 19: The Tasker pulverizer which has been on trial at the Eureka mine in this place for the past month has been condemned. It is of no practical use. It has been faithfully tried. When one difficulty could be overcome others would follow. The balls wore uneven; too much time was wasted in the tedious work of opening and closing the mill for changing the ball and tightening the same; the screens broke too often; the concentrators could not be made to save half the sulphurets, and what they did save were two-thirds sand.

Inyo.

ELNA.—*Independent*, Oct. 20: The machinery is being put in place, and by November 1st the furnace will be ready to fire up. Wood and coal are being delivered in quantities sufficient to warrant a steady run when once smelting begins. The plant will constitute one of the finest smelting works of its size on the Pacific Slope. A large, finely appointed, and complete sampling room is connected, also an assay office.

A NEW MILL.—Chrysopolis will soon have a five-stamp mill. A company composed of New York men owns a group of mines which contain free-gold rock. S. S. Barrie is here representing the company. He expected to break ground this week.

AT REILLY.—The following, relative to the Argus Range S. M. Co.'s operations at Reilly, is reliable. The mill was run 4 days last week, during which time 30 tons of ore were worked. The clean-up produced 137 ounces of bullion .928 fine, worth about $2,200. The mill is not shut down for want of water.

THE MODOC.—Through a private letter we learn that Supt. Fitzgerald started up his furnace at 5.30 P. M. Oct 13, and up to date (17th) had beaten all previous records of output since F. H. Selby's run in May, 1877, making 4 tons of rich bullion per day.

Mariposa.

MARIPOSA IMPROVEMENT CO.—*Herald*, Oct. 19: The following is an extract from the prospectus: "The Mariposa Improvement Co. is organized under the laws of California; and the design is to work on a system that will enable them to handle a large amount of ore at the minimum cost. They propose to build a plant at the mouth of Cotton Creek, on the Merced River, that will be run by water, and handle from 200 to 400 tons per day. The system of narrow-gauge railroad that they propose to put in is not to carry the ore from one mine, but from a large section of country. They have mines enough already opened to supply ore for years."

Nevada.

IMPERIAL.—Grass Valley *Tidings*, Oct. 18: The Imperial Co: are pushing the changes in their machinery rapidly. The engine formerly used for hoisting will be used for pumping. A 6 horse-power engine with friction gear will be used for hoisting. A 6-in pump will, with the rest of the machinery, be ready to be taken to the mine by Saturday. The lumber is on the ground, and it is expected that every thing will be ready to turn on steam by the 27th of this month.

IRONCLAD—*Transcript*, Oct. 20: Arrangements have been made by which eastern parties, represented by Brand Bros., of this city, will to-day recommenee work on the Ironclad quartz mine in Rough and Ready township, which has been idle for more than a year past. The property was until yesterday owned and controlled by Wm. Cammet and others, who put up fine hoisting works and a five-stamp mill, sunk a shaft to a depth of 235 ft, run two levels, and found good ore, but their facilities were not such as would reduce tellurium, which it was.

Plumas.

YANKEE HILL.—Cor. Oroville *Mercury*, Oct. 19: There is more good milling ore in this belt of country between the north fork and west branch of Feather River than any other portion of the state I have visited. It is reported here that a mine known as the Durett & McConnell mine, half a mile from Yankee Hill, has been sold to capitalists. There is also a rumor that they have struck a large vein of gold-bearing quartz in the Big Bend tunnel. If this is true it demonstrates what has been in doubt in regard to the veins holding to any depth, as the tunnel must be at least 1,000 ft below the surface.

RICH GULCH QUARTZ.—Quincy *National*, Oct. 20: Hallsted & Co. are running a prospecting tunnel to the ledge, which will tap it 200 ft deeper than the present workings, and it is expected that the tunnel will strike the ledge in a few days. This will prove that they have a valuable mine, and will make them independent.

LIGHT'S CANYON.—Prospect work on Major Whitlock's silver mine in Light's Canyon is being pushed steadily, and the ore is looking first-rate. Plumas will have a paying silver mine yet.

GREEN MOUNTAIN.—Greenville *Bulletin*, Oct. 17: The boiler has been moved from the Cherokee mine to Green Mountain, to furnish power for the air compressor should the water in the reservoir be exhausted. This will insure the continuance of work in the main tunnel in any event.

THE GARFIELD MINE.—This mine is under the complete control of W. J. Reynolds. On Monday he put men to work and will get the mine in complete working order. All the indications are very encouraging.

GOLD STRIPE MINE.—All outside work is suspended for the present at the Gold Stripe. Supt. Standart says he will keep 6 miners at work all winter prospecting.

Sierra.

SLUG CANYON.—Downieville *Messenger*, Oct. 20: D. R. McKillican, of North Bloomfield, was in this section last Monday, on a tour of inspection. Tuesday he went to Jerome York's quartz mine, in Slug Canyon. This is one of the most promising properties in this section. It has not been extensively developed as yet. The ledge varies in width from 2 ft upward. It has been uncovered in three places, and each opening shows fine ore. A substantial arastra has been erected, and was profitably run while the water season lasted last spring. The mine is 1½ miles from the river, and 800 ft above it.

Tuolumne.

LAMPHIER.—Sonora *Democrat*, Oct. 20: The developments in the Lamphier mine continue encouraging. The north drift is in about 50 ft, with a vein of splendid quartz over 3 ft wide in the face. In the south drift, which is in nearly 70 ft, the ledge continues large and very rich. The prospecting mill will be ready for crushing in about 15 days.

PAMPA HILL.—The gentlemen who own the Stockton mine have recently purchased the Pampa Hill mine near Rawhide, and have commenced to develop it. The showing so far is very good, and some fine rock is being taken out.

NEVADA.

Washoe District.

HALE AND NORCROSS.—Virginia *Enterprise*, Oct. 20: On the 2700 level the north drift, now running westward, is cutting quartz of favorable appearance. The south drift on this level was turned and driven some distance west. From it a drift has been started south on a streak of clay and quartz which promises well.

UNION CON.—On the 3000 level the west cross-cut has been discontinued for the present, and a cross-cut started east to explore. At the 3100 level preparations are making for opening a working station 12x18 ft in size and 12 ft in height.

MEXICAN.—The connection has been completed between the raise from the 2900 level and the winze down from the 2700. Workmen are now enlarging and timbering up the connection. The main north drift on the 3100 level is pushed at the rate of 30 ft per week.

SIERRA NEVADA.—North lateral drift No. 1, on the 2900 level, is being pushed at the rate of 30 ft per week. A raise will soon be started from this drift to connect with the winze down from the 2700 level.

YELLOW JACKET.—Good progress is being made in introducing steam power in the Brunswick mill, and soon the work of extracting ore may be resumed.

GOULD AND CURRY.—On the north line a station

is being cut out in east cross-cut No. 1, on the 2500 level, for a winze joint with Best and Belcher.

OPHIR.—The exploring drifts on the 150 level have found some old fillings that will pay for working, but thus far nothing of value has been found in new ground. Ore is again being extracted from the croppings.

ALTA.—The water will soon be out all the way to the bottom of the mine at the 2150 level, when active prospecting may again be resumed. The machinery is working well.

BEST AND BELCHER.—Are cutting out a station in the joint winze in east cross-cut No. 1, on the 2500 level, at the south line. The flow of water from the north drifts in as strong as ever.

ANDES.—Are still finding some paying ore in north drift, and the drifts from the bottom of the winze are showing quartz of a good appearance.

CROWN POINT.—Work is gradually being resumed in the lower levels. As soon as the mills can crush the ore a full force of miners will be put to work.

BELCHER.—Are preparing for the extraction of ore, which will be fully resumed as soon as the mills on the river are in full operation.

SCORPION.—The west drift on the 500 level is passing through vein porphyry, showing occasional streaks of quartz and seams of clay.

IMPERIAL.—The station at the 600 level was completed yesterday, and a drift will now be started west to the old upper levels.

UTAH.—Good headway is being made in the north drift on the 1350 level, in material of a favorable character.

SAVAGE.—The explorations near the south line have shown up a large body of quartz giving low assays.

CALIFORNIA.—Joint Con. Virginia winze No. 2 is being sunk at the rate of from 12 to 15 ft per week.

CONFINATION SHAFT.—Will soon be ready to receive and set up the machinery of the new hydraulic pump.

CON. VIRGINIA.—Joint California winze No. 2 is being sunk at the rate of about 15 ft per week.

OVERMAN.—Some ore that will pay for working is being found on the old levels.

UNION SHAFT.—Are still casings timbers and repairing the station at the 2300 level.

Belmont District.

SEVENTY-SEVEN.—*Courier*, Oct. 13: Green Aldrich has had two men employed for the past few weeks in exploring the Seventy-seven mine, north of town. On Tuesday last, they struck a large pocket of ore, which assays way up in the hundreds.

BELMONT.—The work of development progresses satisfactorily in the Belmont mine. Rich chloride and black metal ore is extracted daily. The leaching works are almost completed and the mill will soon be ready to start up. The following is a copy of Superintendent's letter of October 13: The Laity ground shaft No. 1 is 115 ft in depth, from which we are starting a drift to the north, in good ore. All stopes are producing good ore. During the week, level No. 1 has exposed splendid ore in the south end. South tunnel stope showing fine ore, in which we are preparing room for more men. Mill construction is nearly completed. We are hauling ore to the mill.

Candelaria District.

NORTHERN BELLE.—*True Fissure* Oct. 20: The drift under the hanging wall on the tenth level looks very encouraging, and shows a foot of ore giving very good assays. The seventh and ninth levels are turning out a limited quantity of fair ore. The new development above the seventh level looks well as far as opened, and a small addition to the surplus of ore is being made. Both mills are running as usual, five of the stamps of mill No. 2 being engaged on crushing ore from the Great Western mine in Garfield district. A shipment of bullion amounting to $6,658.86 was made last Monday.

MOUNT DIABLO.—The drift below lower winze No. 2 shows a strong ledge, which is turning out some $45 quartz. The stope from this winze is yielding considerable $55 ore. The stope below the third level, and near winze No. 1, shows a strong ledge of $50 ore. A shipment of bullion valued at $10,697.12 was made on the 15th instant.

COLUMBUS CON.—The drift from cross-cut No. 1 was advanced about 12 ft during the week, making a total length of about 23 ft. The streak of ore has continued all its length, and gives good assays all the way. The drift running west from the bottom of the Bonanza winze has attained a length of 22 ft. The drift running east is now 12 ft in length, and is showing more encouraging prospects.

Esmeralda District.

WASSON CON.—*Herald*, Oct. 20: Some 9 miles southeast of New Boston, and in Santa Fe district, are the company's mines. The Lucky Baldwin was the first inspected. It is 1500 by 600 ft, and several drifts have been run on the vein, opening up large bodies of high-grade ore. During last spring some 300 tons of ore milled a trifle over $84 per ton. The ore requires roasting, but it is not very refractory. The ore closely resembles that of the Northern Belle, being a soft chloride, and easily crushed. The Comstock mine lies one mile northeast, and has a perpendicular shaft 60 ft, all in ore. A level has been run from the bottom of the shaft, opening up an extensive body of very rich ore that displays horn silver and chlorides. The Belleville mine has cuts, drifts and inclines run upon it, opening up fine bodies of high-grade. The Cotbridge has an open cut upon the ledge 75 ft, that has stripped the ledge, exposing a fine body of soft, decomposed quartz, rich in silver.

MOUNT CORY.—Car-loads of material and machinery continue to arrive. The boilers are in place, the engine beds laid, and the greatest activity in apparent. Those who have seen the large mills of other mining localities will be surprised when they view and inspect this one. Coryville is situated in the canyon, about half a mile from the Mount Cory mine. New houses are in course of construction. Parties with ample capital will soon take charge of the Crossman mine, and unless signs are at fault, this district will, by another year, be the bullion producer of Nevada.

Paradise District.

WILD GOOSE.—Reno *Journal*, Oct. 20: "Big Nick" Freyer is in Winnemucca from the Paradise mines, and gives glowing accounts of their appearance, especially the Wild Goose. He says they have an immense body of ore extending from surface to the lowest depth yet attained—about 175 ft. On the Live Yankee they have run a drift and upraise for ventilation, and are now preparing to run on the level and take out ore.

Pioche District.

EL DORADO CANYON. *Record*, Oct. 13. The Southwestern Co. are working a larger force than has been worked for years. The Techatticup mine is yielding the precious metal by tons daily. Some 23 men are employed at the mine. The mill, which is a 15-stamper, is kept running night and day; and as the mill is new, it is rare that a break occurs. The stream of bullion it has turned out since it started up is enormous. The mine keeps ahead of the mill about 500 tons, which shows that the ore supply at the mine is good.

NOTES.—Partridge, McGregor & Co. have a fine piece of mining property known as the Flagstaff. The ore is shipped to San Francisco, where it is disposed of at $400 per ton. Jim Cronin is preparing to start up on his mines again. When both mills are running at the canyon and the chloriders get their ore crushed, it makes times lively. Fred Nickle & Co. have been shipping some very rich ore to San Francisco, that was sold for $1,600 per ton.

Pyramid District.

PYRAMID MINE. Reno *Journal*, Oct. 20: C. Derby and Alvaro Evans came in from Pyramid yesterday. They say the ledge has been struck and passed through, and is between 30 and 40 ft in width. They brought in a lot of the rock, and it looks exactly like Comstock quartz, but the fear is that it will only assay from $12 to $25. An upraise has been started for the bottom of the shaft 172 ft. To make the upraise will take about 20 days. This will give ventilation, and lead to the ore known to exist at the 400-foot level.

Tuscarora District.

GRAND PRIZE.—*Times Review*, Oct. 14: The west drift in the 200-foot level is in 69 ft. The drift is being timbered. As soon as it is completed, stoping above it will be commenced. Have commenced stoping above the 300-foot level; stopes producing good ore. West drift on the 400-foot level is in 74 ft. Have cut through the cross-cut and will be to the ledge in a few ft. The *Times Review* of the 19th says: The Grand Prize mill will start up on the fifth of next month on ore from between the 200 and 300-foot levels. The stope opened out at the 300 is 100 ft in length, and car samples during the last week averaged $200 per ton. There is every indication that the mill will have an unusually successful run.

INDEPENDENCE.—North drift, 300-foot level, has attained a length of 860 ft; progress for the week, 15 ft. West cross-cut, 300-foot level, to connect with raise from 400-foot level, is out 34 ft; progress, 23 ft. The flow of water on the 500-foot level has decreased one-half during the week.

BELLE ISLE AND NAVAJO.—Work is progressing as usual.

ARGENTA.—North cross-cut on the 400-foot level is in 141 ft; progress for the week, 13 ft. Face of cross-cut is in favorable formation.

NORTH BELLE ISLE.—During the week have been timbering south drift, 300-foot level. The stopes on the 70-foot level are producing the usual ore.

ELKO CON.—Since last report, shaft No. 2 has been extended 15 ft. Total depth, 170 ft. There has been a favorable change in the formation, it now being porphyritic and carrying small stringers of ore.

ARIZONA.

PECK DISTRICT.—*Courier*, Oct. 13: The Black Warrior mine is now considered one of the best mines in the territory. The vein is large and rich. Twenty-five men are employed in the mine and ten at the mill, which latter institution has four stamps, capable of pulverizing 5½ tons of ore every 24 hours. Silver bar, No. 37, worth $1,000, was on Friday shipped East. From October 1st to the 9th, six bars of fine bullion were shipped. The mill has been running but a short time, and yet $40,000 have been taken out and shipped to the owners in New York.

HOWELL'S.—The Howell Co.'s mill is running on Belle gold ore. The result of the last run on silver, was eight bars of bullion, which have been shipped East. Two Cornish rolls are on the way, and will be added to the mill.

CLIP MINE.—*Sentinel*, Oct. 13: On the whole, the Clip mine has made a magnificent showing. With a ten-stamp mill, this property has yielded in six months time, including stoppages for repairs, $80,000. Silver district has made a record.

PINE SPRING.—*Miner*, Oct. 12: The Gavin mine is down 102 ft. They are drifting south on the 72-foot level in a large and well defined body of native silver ore.

CASH ENTRY.—Rodenburg and Shaw are down 50 ft in good ore, consisting of chlorides and sulphides. Work is progressing with all the force that can be employed to advantage. Yankee Boy is down 30 ft in good ore, principally chlorides, free-milling, which is being taken out as fast as the force at hand will allow. In the None Such, they are taking out good ore. They are down 187 ft, and are drifting north.

A RICH FIND.—Tombstone *Epitaph*, Oct. 12: A Mexican gentleman named Jose Salazar, who lives on a ranch twenty miles south of Tucson, created considerable excitement among old settlers when he came in Wednesday and recorded a notice of the location of the Tumacacori mine, and exhibited some of the ore. The mine is located one mile east of the ruins of the old Tumacacori Mission, and three miles from the ancient town of Tubac. The mine was worked by the Jesuits more than a hundred years ago, and the records say it contained untold thousands of dollars in rich silver ore. But years of neglect removed the old landmarks until its exact location was lost sight of. Although immense sums of money had been spent during the past twenty years by parties searching for it, its location never could be found until Senor Salazar accidentally stumbled upon it. He brought in some samples of rock yesterday which show native silver in great abundance.

GIRARD.—Work on the 200, 300, and 350-foot levels continues. The ore in the latter has completely changed from a sulphuret to a carbonate. The Superintendent will commence shipments of high-grade carbonate ore to Benson to-morrow. Considering that the force of men worked in this mine is only a small one, numbering but 15, the ore output is remarkable.

MUSIC MOUNTAIN.—Mineral Park *Miner*, Oct. 8: The mines in Music Mountain are looking splendidly, and large quantities of high-grade gold ore are being taken out. The only drawback to the profitable working of mines in that region is the scarcity of water for milling purposes. The ore is free-milling gold quartz, running from $40 to $500. Water costs the miners about 13 cents a gallon.

COLORADO.

ANOTHER RICH GOLD STRIKE.—The *Register-Call*, of Oct. 12, gives this item from the Pueblo *Chieftain*: News of another big gold strike is received, which promises next year to create a second Summitville. Mr. Stewart Maxwell arrived in this city yesterday from Del Norte, and will be followed to-day by his partner, Thornton Chase, formerly of Pueblo and later of Denver. These gentlemen have spent the whole season in prospecting for a continuation of the Summitville gold belt, remaining all summer in the heart of the San Juan Mountains, somewhere beyond Del Norte. Mr. Chase has been aware of a gold find made there years ago, the discover of which died before disclosing his secret. He was determined to put in a season searching for it, and it looks now as if the two are to be well rewarded. They had an assay made at Del Norte, which showed about $1,000 to the ton in gold. This created great excitement, and Senator Bowen now has men flying all over the country trying to find the place. Before they left they camped in three inches of snow, which will effectually conceal their discovery until next spring.

BLACK HAWK RETORTS.—Wayne Tucker, who has charge of the New York Co.'s 75-stamp mill in Black Hawk, brought up to the Rocky Mountain National Bank several gold retorts last evening, among which was one weighing 105 ounces, the yield of five cords of mill dirt treated from a mine near this city. This is an average of 21 ounces gold per cord. This is good enough for the oldest inhabitant.

SHIVELY.—Georgetown *Courier*, Oct. 11: John Frazier, who is leasing on the 255-foot level of the Shively, east of the main shaft, has from 1 to 2 inches of ore that will mill from 200 to 500 ounces per ton. Two miners took out over a ton last week. The 230-foot level is being driven east by Smith & Co. They have from 3 to 4 inches of gray copper and galena, the first-class of which runs from 300 to 800 ounces of silver per ton.

SUMMIT.—Excellent mineral is being taken out of the 170-foot level. One party took out 30 sacks of first-class in one week. The last mill run from this place returned 1440 ounces for first-class, and second-class, 328 ounces silver per ton. They have drifted 46 ft on the lower level, east and west, and found ore the whole distance.

IDAHO.

BAVARIAN.—Wood River *Times*, Oct. 10: Frank Phuntz & Co., the owners of the Bavarian, have sent five tons of ore to the Hailey sampling works, which carry an average of 90 ounces of silver and 75 per cent lead. The vein is two ft wide.

MULDOON.—The shutting down of the mine was entirely unexpected, even by Colonel Ballentine, the Supt. Only three men are now working. An extensive and rich ore body was struck in the mine just two weeks prior to shutting it down, so that there can be no doubt about work being resumed early in the spring.

SAWTOOTH.—Seven bars of bullion, aggregating 495 pounds in weight, and valued at $8,250, were received to-day from the Columbia and Beaver mill, at Sawtooth. This is the second shipment, the two aggregating about $14,000 since the starting up of the mill, or about $500 per day.

PIGTAIL DISTRICT.—Ketchum *Keystone*, Oct. 10: We learn from James Kellogg, just down from Pigtail mill, that the Fisher five-stamp gold mill has been running steadily for several weeks, and is consuming five tons daily. Duckdale & Sheron, the owners, have a small crew on the mine, which has so far yielded handsomely. They have laid in a large amount of winter supplies. The Fisher mine bears a gold quartz ledge of several feet, containing an ore vein of from 12 to 15 inches, that yields an average value in gold of from $100 to $140 per ton. The ore is very easy milled; the operation, though on a light scale, is the handsomest paying in the country. The capital invested is comparatively nothing, and the dividend is constant and good.

BALTIMORE GROUP BONDED.—The Baltimore group of claims, one mile east of the Elkhorn, owned by J. C. Cobaugh and Ed. Preston, has been bonded to James Hickey, of Salt Lake City, for $50,000. This property includes the Baltimore and Victoria mines, and is considered one of the best in the vicinity. There are 100 tons of ore on the dump, taken out in development work, and large bodies are uncovered, ready for stoping.

ELKHORN.—Eight additional miners have been put to work on the Elkhorn mine, making a total force of 38. We are informed that operations will be pushed for the next month or six weeks, at the end of which time the regular crew will be reduced one-half for the winter.

EXCELSIOR.—Challis *Messenger*, Oct. 9: Last Thursday an ore body was struck in the Excelsior, and the forces have been driving for over two days across the vein, and are unable yet to reach the opposite wall. Those who know, say that the ore bed looks better than in its best. Its output was over $40,000 last year.

VIENNA.—The Vienna Co. will employ 100 men about their mill and mines during the winter. The preparations for winter are complete.

NEW MEXICO.

OLD MAN.—Silver City *Enterprise*, Oct. 12: At the Old Man, operations are now confined to the driving of the cross-cut tunnel, and to the exploring of the vein from the bottom of the upper shaft. At one point in the bottom of the cut, there is a splendid showing of decomposed quartz, literally covered with scales of horn-silver, while the interstices of the rock are lined with the precious stuff. One large piece, weighing about 75 pounds, was estimated to contain silver at the rate of $10,000 per ton.

GOLDEN RULE.—The Golden Rule mill has increased the amount of ore treated to sixty tons per day. The ore treated averages from $20 to $30 per per ton, and in round figures it is safe to estimate each day's run at $1,500.

SHERMAN.—The Sherman mine was bonded yesterday to W. H. Newcomb to the 1st of January. Mr. Newcomb will immediately put a force of men to work and develop it. Williams Bros.' interest is bonded for $40,000.

LEGAL COIN.—A one-fourth interest has been purchased in the Legal Coin claim, at Fleming, by M. Germain, of J. C. Woodward. The claim is the one on which rich ore was discovered about two weeks ago.

THE NEW STRIKE.—The new strike made a short time since by Crowley, Christenson and Thayer has produced fifty sacks of ore thus far. It is exceedingly rich in chloride and sulphide of silver.

CARLISLE.—Deming *Tribune*, Oct. 11: Samples recently brought to the surface from a depth of 270 ft, assayed in silver $974.53; gold, $369.57; total, $1,344.10. Their mill is at a convenient distance. This property is owned by the Messrs. Farrish, Leach and others, in Cochise County.

BLACK RANGE.—Work on the Colossal now consists of driving the tunnel into the hill on the vein, and bailing out the water in the shaft; also in sorting a car-load of the rich ore, lately taken out, for shipment to Denver. Supt. McMillen believes that the Colossal will be the leading mine of the Black Range. That it can not be worked much deeper without machinery is evident.

MONTANA.

A BIG VEIN.—*Inter-Mountain*, Oct. 12: S. O. Remington, of Lincoln gulch, reports what must be the banner lead of Montana for width. It is 40 miles from the mouth of Big Blackfoot and about 18 miles from Nevada valley. The ledge is 300 ft wide, and can be traced on top for a distance of 600 ft. The vein samples from $15 to $25 across the entire width, and carries free gold and silver. Mr. Remington has developed the mine by a tunnel 62 ft in length, and is working his ore in an arastra with two 12-ft beds. He states that he has water power sufficient to run 40 stamps. Three-fourths of a mile from this phenomenon is located the Doctor, a claim owned by a syndicate of Helena physicians, the ore from which is being worked in a 10-stamp mill, with very favorable results. This claim was sold two years ago for $600, but it would take a considerably larger sum to touch it now.

A HUNDRED TON SMELTER.—A prominent mining man in Butte to-day received a telegram from Saly Raunheim, who is in New York, stating that he has news of a proposed 100-ton custom smelter, which is to be located in Butte, provided satisfactory arrangements can be made, and asking what inducement will be offered to erect it here. Considerable regret has been expressed from time to time that the Anaconda works were not located at Butte.

COMET CITY.—Butte *Miner*, Oct. 13: The Comet mine is being vigorously developed. About 35 men are employed, and the number is expected to be increased soon to 75 in the mine and mill. Mr. McIntyre, of the Arctic mine, reports fine progress in the development of that mine. Some 800-ounce ore has been taken out and the samples are averaging well all through. The smelter at the Amazon is nearing completion and will be in running order by November 8th.

ALICE.—Butte *Miner*, Oct. 10: A drift from the 400 is now being run for the south vein, which seems to make down back of the old workings. So far as developed this ore body improves. In the 100 the stopes are now in a splendid body of black sulphurets, which breaks off from the ledge in blocks and works and mills easily. The ore assays from 120 to 130 ounces. The west drift from the 800 has advanced 125 ft from the bottom of the winze, and the stopes are in 58-ounces ore.

UTAH.

BEAVER LAKE.—Southern Utah *Times*, Oct. 13: The Nabob has been worked by parties who gouged out what ore was in sight, without doing anything towards prospecting the mine, and did not even hoist the waste rock. The present owners have cleaned out the mine, and have gone to work in earnest to develop it. The main shaft, an incline 85 ft in depth, was sunk on a vein of ore which dips easterly. From the shaft four drifts have been run on the vein. Work at present is being prosecuted 80 ft below the surface, and is in 30 ft. A large vein of ore, in some places 5 ft in width, crops out on the surface, directly above this drift, which can be traced for 300 ft. The ledge matter is becoming wider and the face of the drift softer. The ore now being taken out of the Nabob is galena, mixed with the chloride and bromide of silver, and will assay 500 ounces to the ton.

BLUEBIRD.—The ground is soft and can be worked with little powder. The ore is galena, carrying chloride of silver, assaying 60 per cent lead and from 150 to 300 ounces silver to the ton. This is one of the finest prospects in the camp.

WHITE MOUNTAIN.—There is a fifteen foot incline shaft, exposing a vein of ore fifteen inches in width at the bottom. There is a regular hanging wall of limestone. The shaft is sunk through a species of quartzite; the ore is carbonate, and assays 107 ounces in silver and 41 per cent lead.

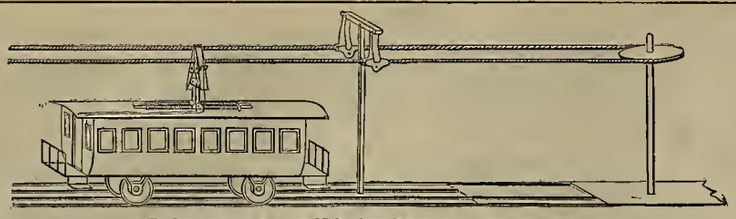
THE O. K.—There are several hundred tons of ore piled on the dump, which will assay between 35 and 52 per cent copper.

CACTUS.—The Cactus Co. is putting a more powerful pump into the mine, and preparing the pipe for winter weather. A set of jiggers and tanks for concentrating work will soon be placed in position.

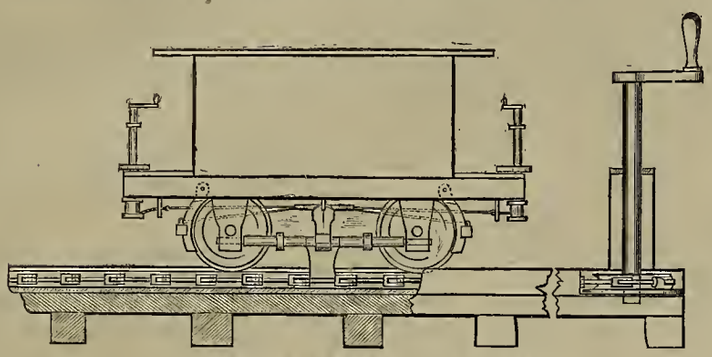
COMET.—A favorable strike was reported as having been made in the Comet mine Thursday.

WASHINGTON.

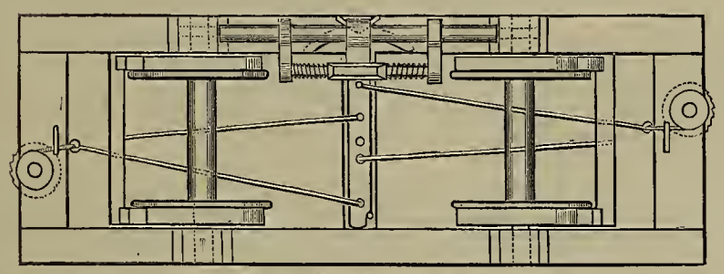
COEUR D'ALENE.—*Inter-Mountain*, Oct. 10: From Frank Carey, who has just returned from Pen d'Oreille lake, we gathered the following items. While at the lake he met parties in from the diggings, and from them learned that there are two claims which are being worked and are paying. Barney Rhudebush and Tom Argyle have dug a drain some 400 ft in length, and are thus enabled to work their claims, out of which they are taking some pay. It is a hard country to prospect in, on account of the heavy timber and the amount of water encountered. A shaft sunk 15 ft in gravel had to be abandoned on account of the water, and as it is on a level, the drains will have to be long. The country is but slightly prospected as yet, and at this season of the year it is said to be a good place to stay away from.



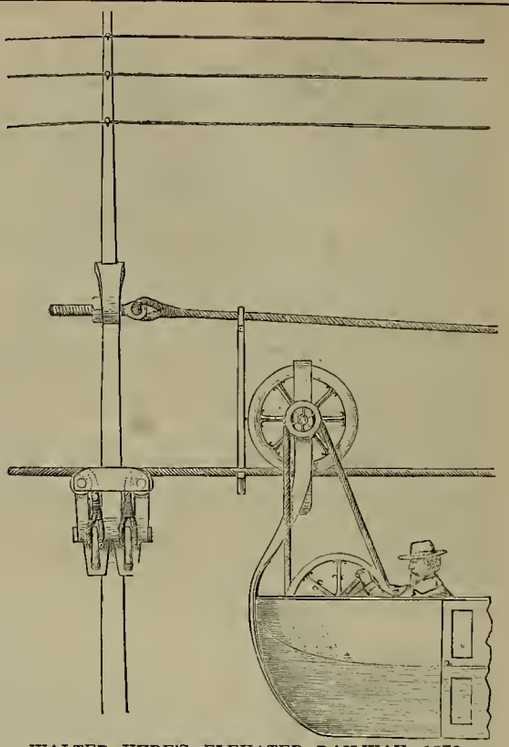
FOSTER & BROWN'S STREET RAILWAY, 1859.



A. C. BEACH'S STREET RAILWAY, 1864.



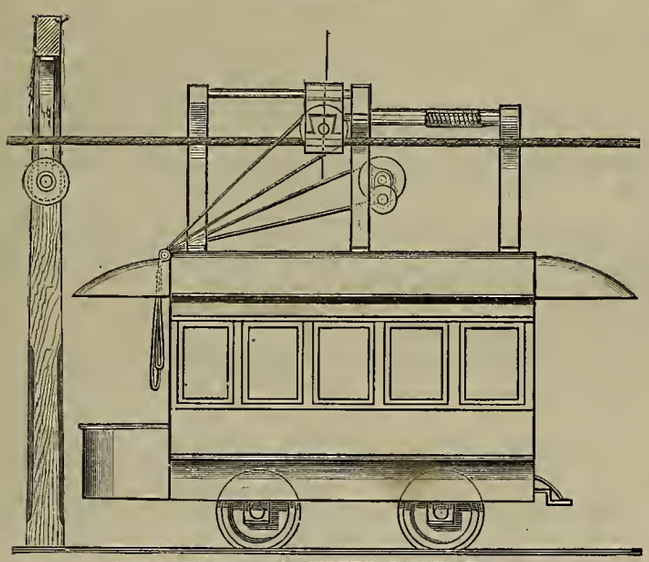
A. C. BEACH'S STREET RAILWAY, 1865.



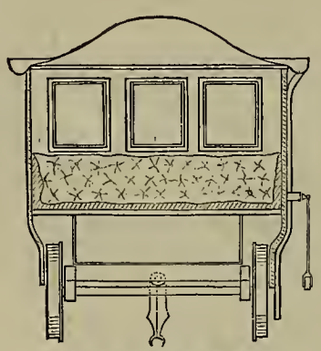
WALTER HYDE'S ELEVATED RAILWAY, 1870.



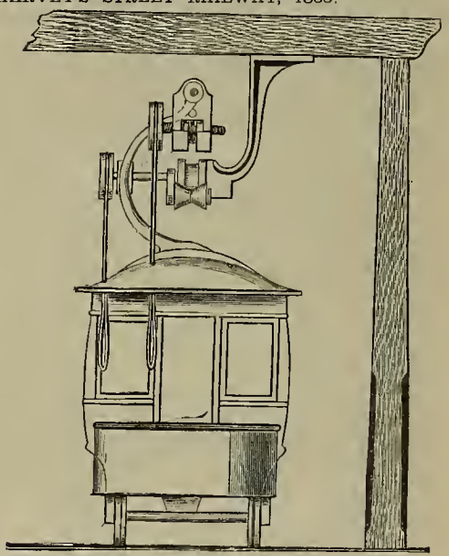
C. T. HARVEY'S STREET RAILWAY, 1866.



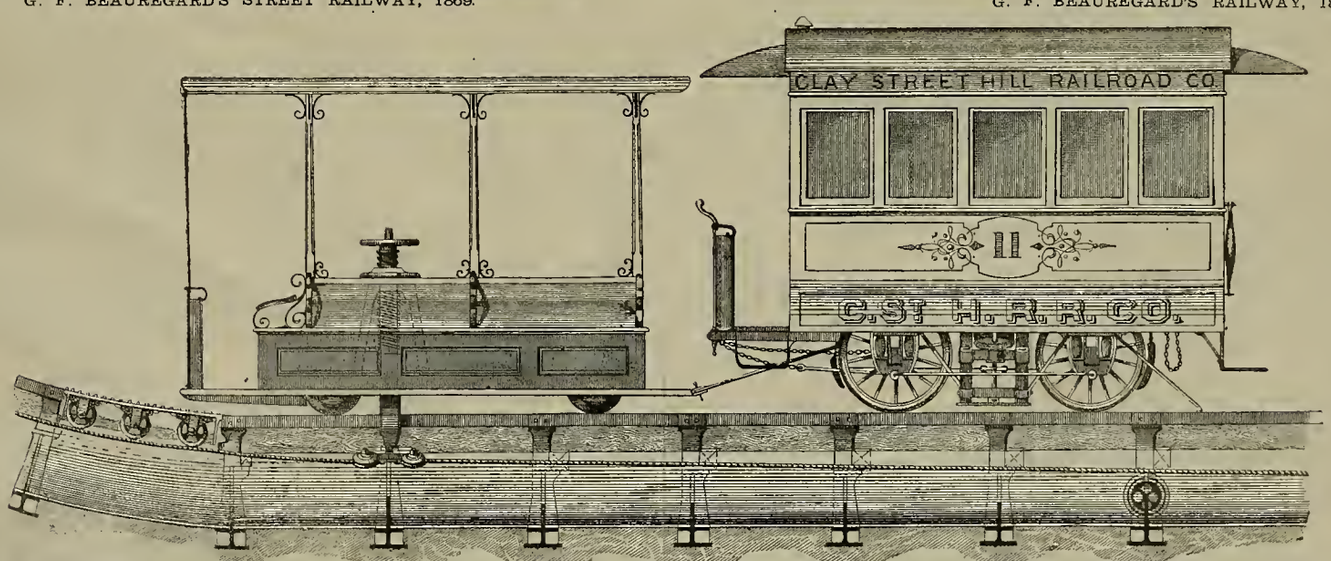
G. F. BEAUREGARD'S STREET RAILWAY, 1869.



C. T. HARVEY'S STREET RAILWAY, 1866.



G. F. BEAUREGARD'S RAILWAY, 1869.



HALLIDIE'S PASSENGER CAR AND DUMMY WITH GRIPPING ATTACHMENT, WITH WIRE ROPE AND SIDE SECTION OF TUBE, 1873.

PROGRESS OF CABLE RAILROAD IMPROVEMENTS.

Geology of Tombstone.

Prof. Wm. P. Blake, in his discussion of the geology of the veins of Tombstone, mentions beds of limestone, shales and quartzite, the outcropping edges of which had been exposed in many places by erosion. These beds in the central part of the district are thrown in a series of wave-like flexures, which may be traced in some cases upon the surface, and are seen to the best advantage in the drifts and cross-cuts of the mines. The quartzite and shales he considers of deep-sea origin, as they show signs of a granular structure. The quartzite is very hard, and passes imperceptibly into layers, forming beds of siliceous limestone organic in its origin, and appears to be a fine sediment totally different from the quartzites with granular structure in the upper strata. It rests upon doleritic limestone, and is regular and evenly stratified for a thickness of 140 feet, and contains an abundance of pyrites, disseminated through the layers of rock in fine crystalline grains. This bed is described by him as a novaculite or hornstone, and he states that above it are found beds of dark, black or blue limestone, and dark-reddish, alternating with black, siliceous shales, and that the black limestones are the chief repositories of the bedded masses of rich silver ores. These formations have been disturbed and uplifted and broken apart in places and rent with fissures, and the explorations of the mines show frequent faults and disjointed outcroppings of limestone beds. The

Grand Central and Contention

Claims are located upon a dike or fissure, varying in width from a few feet to 70 feet, carrying ore with it and alongside of it, and running in a northern and southern direction, cutting indiscriminately through shales of quartzite and limestone. The harder parts of the dike are the most prominent. The contact with the abutting edges of the disrupted beds is not always marked by any great change in their appearance or composition, though in places there are obscure metamorphism, impregnations of silica, and some modifications of structure. The dike itself has a distinct vertical lamination or structure through most of its substance, and is more or less penetrated by veinlets of quartz. In some portions it is highly crystalline and nearly barren, and in others consists chiefly of a feldspathic base, in which the feldspar crystals are obscure. It passes into a felsite, which, in the decomposed portions of the dike, and when slaty in structure, might be mistaken for the partly decayed shales or quartzite. Large portions of the dike are so penetrated by quartz as to consist largely of it, and might be called quartz, although close examination will show the presence of feldspar. If the Contention fissure, upon which the Grand Central is located, is of igneous origin, as asserted by Professor Blake, then there can be no question of the lode going down, and that, too, with a probable increase in size and strength. Thus far the developments in Grand Central substantiate this view of the case, the ledge so far developed on the 600 level being stronger than at points nearer the surface.

The question of the continuation of the ledge downward being settled in the affirmative, the next question is as to its probable

Ore-Bearing Qualities.

For a solution of this last and equally vital point, we are compelled to draw our conclusions from analogy. Looking over the broad field of mining, the world over, we find that where true fissures have been subject to extensive operations, the ore has been found to make with the ledge—in variable quantities, it is true—to the utmost depth attained upon them. Another fact to be taken into account is the manner of occurrence of ore laterally within these fissures. It is a well known fact that the paying bodies are found in chimneys or shoots of ore of variable lengths, often separated by long intervals of barren ground. Thus, too, in depth, these ore bodies are found to have a limit succeeded by barren vein matter. Take the Comstock as an illustration. The surface bonanzas commenced upon the north with the Ophir; thence, going south, came the Gould and Curry, Chollar, and Gold Hill mines. The deep bonanzas were California, Consolidated Virginia, Savage, Hale and Norcross, and Belcher—being sandwiched in between the lesser surface deposits. That a similar condition of occurrence of the bonanzas in the Contention fissure will be found, we have every reason to believe, and that the utmost limit of production will be reached before a depth of 1,500 to 2,000 feet is attained is hardly probable. What may be found below these points, nothing but persistent work will tell.

The Black Hills Tin Mines.—The Deadwood *Pioneer* says: C. Stratton, of the Terra mill, called at this office the other day with a handsome little bar of tin, run from three ounces of ore, taken from the new Sand Creek district. Mr. Stratton is interested in six claims, located on Nigger Hill, Mallory and Sand Creek gulches, and being a practical miner, with many years' experience, knows a good thing when he sees it. The assays recently made by Barclay returned sixty per cent tin, or from forty to forty-five per cent greater than ore from the celebrated Cornwall mines. Not much work has been performed, but great encouragement has been encountered. As Mr. Stratton says, it is a question of quantity, not quality. The quality is all right.

Useful Information.

Paper Marble.

In consequence of the greater hardness of surface and the ability to resist the action of acids, slate or low-grade marble, having an artificial or "marbleized" surface, has to a great extent superseded fine marble in the construction of mantels; but artificial-surfaced articles have always been open to the objection that if any portion of the surface became broken or in other manner injured the exposed portion of the base would present a different appearance, and at once expose the artificial character of the marble represented. Such injury is especially liable to occur while mantels are being shipped and set up, and materially lessens the value of marbleized work. To obviate this objection and produce an article that is cheaper, more durable, and has less weight, an artificial marble composed of a paper base or body and having its surface marbleized has been produced. In the production of this artificial marble, slabs are made in the following manner:

To one and one-half tons of paper pulp, add a solution composed of forty-nine pounds of glue, one and one-eighth pounds of bichromate of potash, fifty pounds of alum, and two pounds of soluble glass or other silicate. This solution is thoroughly mixed with the paper pulp, and the composition is then made into sheets by any ordinary paper-making machinery, the sheets being, however, subject to more than ordinary pressure between the rollers, so as to give them great density. Two or more of the sheets are now coated with the solution named, and placed with their faces in contact, after which they are passed between the pressure rollers, so as to cause their faces to become firmly united, and the whole to be practically homogeneous. The alum and silicate render the slab fireproof, so that it is able to withstand the heat necessary during the marbleizing process, which latter is the same as ordinarily employed in marbleizing slate. The artificial marble thus formed has about the weight of poplar wood, is far more tough and durable than slate, and can not be dented or otherwise injured by any ordinary use, while nothing less than extreme violence can cause breaking or bending of a slab.

The cost of this artificial marble is said to be much below that heretofore obtainable, and its introduction will materially lessen the expense of mantels, shelves, etc., usually made from marble, while from its greater strength and ability to withstand injury, and its small weight, the artificial product is applicable to a variety of purposes for which marble or slate possess no value.—*The Artisan, Nashville.*

Castor Oil for Shoe Leather.

We have several times in past years commended castor oil as a "water-proofing" for boots and shoes, and we are glad to be able to quote the following, to the same effect, from so good an authority as that oracle of hunters and sportsmen the London *Field:*

There is one simple article which will render any decently made boot thoroughly impervious. It is nothing more or less than cold-drawn castor oil, "pure and simple." It is best applied before a moderate fire. The boots to be dressed should be quite clean and dry, and special care should be given to the welt and the tongues and their stitching to the upper leathers. I generally begin by pouring the oil from the bottle all round the welt, so that the angle between the sole and upper leather is quite filled with oil, and then proceed all over the boot, including the edges of the soles, rubbing it in with the hand. When one is done, have a turn at the other, and so alternately till you have got in about a tablespoonful and a half to each boot. The tongues, being thinner leather, should be quite saturated. Subsequent dressings will not require so much oil. I have never found any thing to touch this as a water-proof dressing; the gelatinous oil seems to effectually stop every pore in the leather. There is another advantage for those who are natty in such matters: the boots will soon take a good (common blacking) polish—so much so, that a man may if he likes water-proof his ordinary walking boots for bad weather without spoiling their appearance. With a common walking boot of ordinary thickness, apply the oil all over the sole. Shooting, I wear boots so treated, over thick woolen socks, from eight to twelve hours a day, or more, without feeling the slightest inconvenience in any way;—but they have the chilly feel inseparable from all boots that are oiled in any way.

Paper Gaspipes.—These are made by passing an endless strip of hemp paper, the width of which equals the length of the tube, through a bath of melted asphalt, and then rolling it tightly and smoothly on a core, to give the required diameter. When the number of layers thus rolled is sufficient to afford the desired thickness, the tube is strongly compressed, the outside sprinkled with fine sand, and the whole cooled in water. When cold the core is drawn out, and the inside served with a water-proof composition. In addition to being absolutely tight and smooth, and much cheaper than iron, these pipes have great strength; for when the sides are scarcely three-fifths of an inch thick, they will withstand a pressure of more than fifteen atmospheres. If buried underground they will not be broken by settlement, nor when violently shaken or jarred. The material being a bad conductor of heat, the pipes do not readily freeze.

Decorating Zinc Articles.

A beautiful and permanent dark or light green coating, resembling enamel, can be applied to all kinds of zinc articles, especially those made of sheet zinc, says Puscher, in the following manner:

Fifty parts of hyposulphite of soda are dissolved in 500 parts of boiling water, and the solution poured at once, in a fine stream, into 25 parts of strong sulphuric acid. The milk of sulphur that separates will soon ball together in lumps, and settle. The hot liquid containing sulphate of soda and sulphurous acid is decanted, and the cleansed zinc put in it. In a short time it will acquire a very brilliant light-green coating of sulphide, and only needs to be washed and dried. By exposing it repeatedly and for a longer time to this hot bath, the coating grows thicker and the color darker and more brilliant. The temperature must not fall below 145° Fahr.; when it does, it should be heated up to 190° Fahr., to obtain a fine and brilliant deposit.

By dipping these articles in dilute hydrochloric acid, 1 part of acid to 3 parts of water, sulphuretted hydrogen is evolved, and this enamel-like coating loses its luster and gets lighter in color. Aqueous solutions of aniline colors have little effect upon this dull surface, and none on the gray brilliant coating.

The effect of marbling can be obtained by moistening the gray zinc and applying hydrochloric acid in spots with a sponge, then rinsing it off, and while still wet flowing over it an acidified solution of sulphate of copper, which produces the appearance of black marble. As the zinc has generally a dull surface, it must receive a coat of copal varnish.

If 15 grammes of chrome alum and 15 more of hyposulphite of soda be added to the above solution, the article will have a brownish color. The above can all be applied to articles made of cast zinc.—*Neueste Erfind.*

Tar may be readily removed from the hands by rubbing with the outside of fresh orange or lemon peel, and wiping dry immediately. The volatile oils in the skins dissolve the tar, so that it can be wiped off.

Good Health.

Artificial Nourishment.

One of our foreign exchanges relates a novel method for administering nourishment to invalids and persons with weak digestion, which, it is alleged, has been practiced in Paris with much success.

Diseases and enfeebled health commonly owe their origin to the imperfect assimilation of food. When the digestive functions are impaired the body is insufficiently nourished, and is unable to resist the encroachment of disease. For the maintenance of health and for restoration from sickness, it is of the first importance that the food be not only of the most nourishing kind, but that it be administered in a form easy of digestion and assimilation.

In a paper recently communicated to the Medical Hospital Association, Paris, by Dr. Debove, he describes a form of alimentation which has attracted much attention. His system is to supply nourishment in the form of powder instead of bulk. Uncooked meat from which the fat has been removed is minced finely, and allowed to dry in an oven of moderate heat, until it becomes perfectly hard without being burned. It is then reduced to impalpable powder, by pounding in a mortar and passing through a fine sieve. The powder so obtained represents about four times its weight in flesh. The fiber and the large percentage of water contained in the flesh are thus removed, and the essential properties of the meat retained and presented in a form not difficult to digest. Other alimentary substances, such as lintels, beans, peas, etc., can be prepared in the same way.

In cases of consumption the treatment is said to have proven remarkably successful, and in general debility and nervous diseases arising from weakness, restoration is rapid and permanent. A few spoonsful of the powder are equal to the meal of a person with a healthy appetite. The powder, when bottled, will keep an indefinite time, and may be taken with a little milk, gravy, wine, water, or other liquid.

Nervousness.

In a very interesting pamphlet by the late Dr. Beard, published just before his death, he throws considerable doubt upon the generally accepted theory of the increase of American nervousness. He claims that his researches upon this subject have formed the foundation of a large and increasing literature in England and Germany. He argues that far from nervousness being a destructive agent in American life, Americans of the brain-working class live longer than Europeans. He further argues that the nervous temperament is antagonistic to fatal, acute, and inflammatory disease, and favorable to long life; that most annoying nervous diseases do not rapidly destroy life, and are consistent with great longevity; that nervousness protects the system against the febrile diseases that are so rapidly fatal to the sanguine and phlegmatic. "In the conflict with fevers and inflammations, strength is often weakness and weakness becomes strength. We are saved through debility." All these facts should afford considerable comfort to those who think that nervousness is wearing their lives away. Negroes are seldom nervous, and yet their mortality through acute diseases is far greater than that of the whites.

Nevertheless, it is well to bear in mind that if we order our lives as we may,—live more naturally and wholesomely,—we may avoid much of the nervousness so prevalent, and thus live longer and happier still.

Medicated Gelatine in Skin Disease.

Prof. Pick, of Prague, has recently advocated a new method of applying remedies to diseased skin. He melts in a water-bath some pure white gelatine, in twice its weight of distilled water, and while keeping up an incessant agitation, adds the quantity of medicinal substance; e. g., iodoform, salicylic or phenic, and pyrogallic acids, and then allows the mass to cool. For use, a portion of this mass is melted in a little receptacle placed in boiling water, and is then applied to the diseased skin by a camel-hair brush. It presently sets, and compresses the skin; but unless smeared over with a little glycerine, in the proper use of which some little experience is needed, the gelatine is apt to crack and fall off. In this way Pick has obtained good results, by the application of a gelatine containing 10 to 20 per cent of pyrogallic acid, or 10 per cent of chrysarobin, after a thorough washing of the parts with potash soap in a warm bath. In severe cases he renews the applications every two days. He has also successfully employed gelatine, medicated with 5 to 10 per cent of salicylic acid, in chronic eczema and some erythematous conditions, and in pruritus. The gelatine is easily removable by washing.

The Birth of the British Isles.—Under the title of "Contributions to the Physical History of the British Isles," Professor Edward Hull has lately published an interesting, if somewhat hypothetical, contribution to Paleophysiography. Perhaps the most remarkable conclusion to which the author has been led by his studies of the evolution of the British Islands, is that which relates to the period of their birth. He believes that until the close of the carboniferous period the British area had no existence as continuous dry land. But at that epoch a series of subterranean disturbances upheaved the sea-bottom in that part of the world and at the same time threw what is now the eastern part of America into a great succession of ridges or folds. These violent upheavals were accompanied by depressions in the intermediate area, and thus the North Atlantic Ocean came into existence contemporaneously with the origin of the British area. In discussing the genesis of the Atlantic Ocean, the author strongly combats the popular dogma relating to the permanence of oceanic and continental areas. Nevertheless he admits that the old mountainous tracts of the north and west of Britain and Ireland, when once formed, have ever since retained their prominent position, and have been rarely, if ever, submerged. For the details of these interesting arguments the original work must be consulted.

Salt With Nuts.—A correspondent of the Germantown *Telegraph* writes that journal as follows: One time, while enjoying a visit from an Englishman, hickory nuts were served in the evening, when my English friend called for salt, stating that he knew a case of a woman who was taken violently ill by eating hearty of nuts in the evening. The celebrated Dr. Abernethy was sent for, but it was after he had become too fond of his cups, and he was not in a condition to go. He muttered, "Salt! salt!" of which no notice was taken. Next morning he went to the place, and she was a corpse. He said that had they given her salt it would have relieved her, and if they would allow him to make an examination he would convince them. On opening the stomach, the nuts were found in a mass. He sprinkled salt on this, and it immediately dissolved. I have known of a sudden death myself which appears to have been the effect of the same cause. I generally eat salt with nuts, and consider it improves them.

How Cholera is Bred and Spread.—In a communication to the London *Daily News*, Dr. Wm. B. Carpenter suggests that Professor Tyndall's doctrine that cholera germs are bred in the human intestines, and from them by means of excrement are diffused, does not go far enough in assuming by implication that the human intestines are the only breeding-place of cholera germs. Dr. Carpenter gives three remarkable instances as evidence that cholera, or at least the almost equally fatal choleraic diarrhœa, was caused by offensive piggeries, by a retarded drain in marshy ground, and by a compost heap of unnamable filth in an unused yard. The outbreak of fatal disease in each of these cases was directly traced to these sources, the effluvium being born on the wind. In each the disease was successfully combatted, and finally conquered by a removal of the filthy cause.

MINING AND SCIENTIFIC PRESS

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SAN FRANCISCO:
Saturday Morning, Oct. 27, 1883.

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Wagons and Carriages—Studebaker Bros., S. F.
Steam Pumps—Goss & Dow, San Francisco.
California Machine Works—W. H. Birch, S. F.
Engines—W. H Ohman, San Francisco.
Machinery Oils—Edward B. Reed, S. F.
Boiler Works—Hamilton, Leach & Madden, S. F.
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Carpets—Hardie & Darling, San Francisco.
Wire Mattress—Truman S. Clark & Son, S F.
Belting and Lacing—H. Royer, San Francisco.
Iron Pipe—Richards & Snow, San Francisco.
Patent Chimneys—J. Browell, San Francisco.
☞ *See Advertising Columns.*

Passing Events.

A great deal of the space in the PRESS this week is devoted to a description of cahle railroads, so that much of our usual mining matter has been left over. A perpetual injunction has heen granted this week against the Spring Valley Miniug Co. to prevent it dumping debris ou certain lands. The company already own several thousand acres of land, purchased for the purpose of dumping ground, and will now have to huy this, prohahly. The latest mining excitement is that in the Cœur d'Alene Mountains, and hoth Idaho and Montana miners are rushing there in numhers, since rich placer mines will always attract a crowd. Winter has set in there, however, so there is not much chance of doing any thing for some time to come. We have rains iu California this week, and in a few weeks, now, winter will set in in earnest.

THE Hailey *Times*, of the 13th, says the Silver King mine, in Beaver Gulch, above Sawtooth, was sold on Saturday to M. T. Scott and Jahez Chase for $125,000.

Cable Railroads.

Growth of the Wire-Rope System for Street Care in San Francieco.

We devots considerahle space in this numher of the MINING AND SCIENTIFIC PRESS to a description of the latest cahle railway huilt in this city. San Francisco, from its peculiar topographical features, was compelled to have some system of street-car transportation which would permit steep grades to he ascended and descended. Cars drawn hy horses or hy steam power are, of course, not adapted to the irregular and steep hills which form so large a part of the city's surface, and it was greatly to the advantage of the whole growth of this metropolis when the cable railway system was put in operation, mainly hy the efforts of Mr. A. S. Hal lidie and associates, who have continued to he prominently identified with it.

A good many ideas of wire-rope transportation for city streets had heen advanced from time to time, and the systems patented; hut none of them were put to practical and successful work until the Clay-street hill road was first operated in this city in 1873. On page 262 are several illustrations of various inventions illustrating the chronological progress of cahle railway improvements, up to the date of inauguration of the first road in this city. Since that time there have heen built here, on the cahle system, the Sutter street, Geary street, California street, Presidio, and Market street roads. The system has also heen introduced in Chicago, Philadelphia, New York, and London. As each successive road has heen built, improvements in details on the general system have suggested themselves and been adopted. On some roads the conditions have heen different from others, and these peculiarities necessitated greater or less modifications, according to their nature. Being a comparatively new field of engineering, there was, of course, much scope for inventive ingenuity, of which practical men have availed themselves. Inexperienced persons, too, have conceived ideas ahout cahle roads, many of them quite startling in their nature. In fact, numerous patents which have heen granted will he of very little use from their impracticahility. At the same time, improvements in detail to simplify and perfect have heen made and adopted, so that now many of the obstacles and difficulties first met with have been removed.

The Clay street line, the first huilt, hegan running in August, 1873, and was a success from the first, though, like all new things, some changes and alterations had to he made before all the difficulties could be overcome.

At the time of the completion of the Clay-street hill road we described its details. In the PRESS of Septemher 3d, 1881, was puhlished quite an elahorate illnstrated article on the various roads in this city, giving a history of the growth of the system, and descriptions of the local roads. Those interested in the details of these roads are referred to that number. To those who have never seen a cahle railroad, the article in the issue describing the Market street road—the most extensive yet huilt, in length, cost, and equipment—will convey a good idea.

The surface of the streets through which a cahle road runs has the same appearance as in the case of a horse car line, except that between each pair of tracks is a flat, narrow piece of iron, with a three-quarter inch opening in its center, running the length of the road, parallel with the tracks. Below the surface, and between each pair of tracks, is a channel or tuhe large enough to contain a rope, with supporting pulleys, and the jaws of the grip. The object of the tuhe is to protect a steel-wire rope, which runs the entire length, up one track and down the other. This endless rope is kept in constant motion hy means of an engine at one end or the center of the road, the rope passing around suitable driving pulleys rotated hy the engine. Different methods are adopted to prevent the rops from slipping on these drivers. At each end of the road is a large pulley, half around which the rope passes, so as to go from one tuhe to the other. A gripping arrangement is mounted on the car or dummy, hy which the car and cahle may he connected or disconnected at will hy the engineer, or dummy-man, who controls the apparatus by means of suitahle levers. Various forms of this grip are used on our local roads, and several other forms have heen patented which have not heen put to use. The rope ou the tuhe is carried on freely-running supporting pulleys, and specially constructed depression pulleys are used for holding the ropes down at the cross streets, on grades where the angle changes. The rope is run at a speed of from five to eight miles per hour, and the cars run at equal speed on a level or up or down the hills. Powerful hrakes, both on the wheels and track, control the car when the cable is released.

Such are the general principles of the cahle railroad system. Of course there are various details on each road, arranged to suit the special requirements or to carry out the improvements made hy the constructing engineers. The plans latest tried are fully described in the article on the Market street road in this number of the PRESS, that road having adopted every improvement of any practical valne which would increase its efficiency.

We have not space on this occasion to say much of the other San Francisco cable roads, hut append a tahle which will give some salient points concerning each.

The diagrams on page 270 show the profiles of these roads. The Market street—the last built—is the longest road, and the Clay street—the first huilt—is the shortest. The latter, in fact, is only built and operated as far as the point designated hy the vertical white line shown in the profile.

All these roads are in daily operation. They are always preferred to the horse cars by the public. On most routes they go where horse cars could not he run, and then equal speed up or down a hill is of course a very great advantage. Once in operation, these roads are run much more cheaply than when operated hy horses, although the first cost of the road is of course greater with the cahle system. The most economical results for the consumption of coal have been obtained on the Presidio road, where they are using engines of the Corliss type, huilt by Hiuckley, Spiers & Hayes, of the Fulton foundry, in this city.

These roads, without exception, have heen profitahle from the beginning, no cable road yet built having heeu a losing operation. In every instance, however, the stock is worth from twenty-five to sixty per cent more than it cost, which is a very important point for capitalists. The experience gained in this city is heing utilized elsewhere, as a matter of course. Most of the patents granted on improvements on cahle roads—for there is no broad patent in existence coveriug the general system—have heen taken out by San Francisco inventors. Here the plan was worked out to practical results, until now San Fraucisco has the reputation of having the most complete, convenient and speedy street-car transportation system in the world.

TABLE SHOWING CONDITIONS UNDER WHICH THE SAN FRANCISCO CABLE ROADS OPERATE.

NAMES OF ROADS.....	CLAY ST. HILL R. R.	SUTTER ST. R. R. CO.	CALIFORNIA ST. R. R.	GEARY ST. R. R.	PRESIDIO R. R.	MARKET ST. R. R.
Commenced operating.....	September 1, 1873.	January 27, 1877.	April 9, 1878.	February 16, 1880.	October 23, 1880.	August 22, 1883.
Length of road, double track.	5,300 feet.	On Sutter St., 13,291 ft. On Larkin St., 3,712 ft.	12,651 feet.	13,200 feet.	13,000 feet.	44,200 feet.
Heaviest grade.....	67 feet in 412½.	36 feet in 412½.	75 feet in 412½.	40 feet in 412½.	80 feet in 412½.	51 feet in 412½.
Number of engines employed.	Two.	Six—4 on Larkin street, 2 on Cemetery avenue.	Two.	Two.	Two.	Four—2 spare.
Weight of empty car.....	2,800 pounds.	3,000 pounds.	4,500 pounds.	4,000 pounds.	4,300 pounds.	Combined, 9,600 lbs.
Weight of empty dummy....	2,100 pounds.	2,000 pounds.	4,100 pounds.	4,400 pounds.	4,300 pounds.	
Intervals of departure.....	3 to 5 minutes.	4 minutes, average.	5 minutes, average.	2½ to 6 minutes.	4 to 6 minutes.	4 minutes.
Average number of round trips per day	221.	253.	226.	228.	210.	493.
Average number of cars and dummies employed.....	7 of each.	14 of each.	14 of each.	16 week days. 20 Sundays.	16.	36 to 44.
Hours run per day	17½.	19½.	19.	19.	17½.	20 hours and 40 minutes.
Number of wire ropes in use.	One.	Four—Sutter street 3, Larkin street 1.	Two.	Two.	Two.	Five.
Lengths of ropes used	11,000 feet.	11,537 feet. 7,849 feet. 9,800 feet. 8,500 feet.	8,840 and 17,055 feet.	16,600 and 11,000 feet.	12,500 feet. 13,500 feet.	24,125 feet. 20,194 feet. 20,002 feet. 20,439 feet. 6,000 feet.
Circumference of wire rope..	3 1-16th inches.	3 inches.	4¼ and 4 inches.	3 inches.	3¼ inches.	3¾ inches.
Speed at which ropes travel..	525 feet per minute.	421 ft. and 786 ft. per min.	537 feet per minute.	600 and 650 ft. per min.	537 feet per minute.	750 feet per minute.
Remarks.....	The engine house is located on top of the hill, and about midway between the two ends.	This company has two engine houses. In the one there are four engines, and in the other two.	The engine house of this company is situated in the hollow, 4,220 feet from Kearny street.	The engine house of this company is situated 8,000 feet from Kearny street.	Engine house is 6,000 feet from Montgomery Avenue.	The engine house is 11,900 feet from the ferry.

A Double Edition.

This number of the MINING AND SCIENTIFIC PRESS is a double sheet of twenty-four pages, largely devoted to consideration of cahle railroads, a subject for a long time one of local interest only, hut now attracting attention all over the world. We describe in detail the last one completed of our local roads, and give numerous original engravings to aid the description. There are also other engravings illustrating the growth of the cahle system, etc.

This number of the PRESS possesses increased value not only to engineers hut to the general puhlic. We have printed a very large edition—some thousands more than usual—appreciating the desire to learn the details of construction and operation of these roads. The PRESS of this week will be found worthy of preservation for reference.

THE United States Sub-Treasury in San Francisco has now prohably a larger amount of money on hand than at any previous time in its history. The total is upward of $71,000,000, including $35,000,000 in gold coin, $16,000,000 in standard dollars, $7,000,000 in fractional silver, while the remainder is in paper money. There could not he a hetter man to take care of this large amount of money than N. W. Spaulding, the Assistant Treasurer.

The Market Street Cable Road.

(Continued from page 257.)

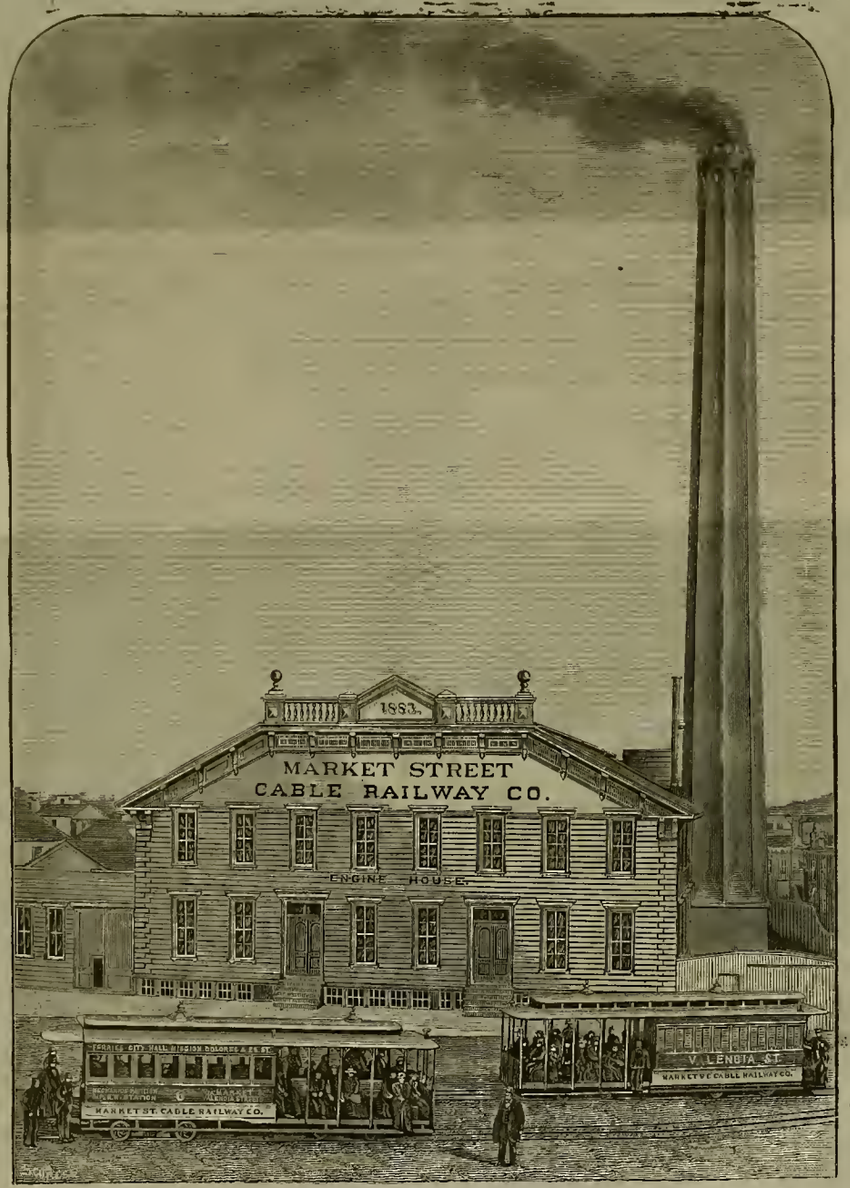
in 100 at the steepest place. The diagram shows a profile of Haight street.

The Engine House.

The engine house where the motive power of the cables is applied, is on the south side of Market street at the junction of Valencia. At this point Valencia leaves Market by a curve to the southeast, and Haight street branches off at an angle of about 35 degrees from Market to the northwest, some 500 feet before Valencia is reached. The plan accompanying this shows the relative position of these streets. In the rear of the engine house are bunkers which hold 2,000 tons of coal, which may be dumped into them through chutes in the yard above. Heavy brick pillars and arches support the roof of this portion, which forms the floor of the yard above. Outside the coal bunkers is an artesian well which supplies the boilers with water. One of Dow's direct-acting deep-well pumps raises the water from this well, supplying first the heaters for the boilers, the surplus going to a tank above.

The main portion of the basement is covered with a heavy brick flooring and foundation to the boilers, engines, heaters, etc. The room is well lighted and ventilated. In the rear of the engines are the long pits and tracks for the stretching apparatus. One of the engravings given with this article shows the plan of the engine-house, and arrangements on the street for the angle sheaves of the various cables. G are the spur-wheels of the engines, which engage with each other, though the engraving shows a clear space between. The drivers are represented by H. The cable from the ferry is represented at A; and the same rope, returning to the ferry after going around the drivers and tighteners in the engine-room, is represented at B. The sectional view shows the tighteners. The Haight street incoming and outgoing rope is represented at F F. The outgoing Valencia street cable is marked by C, and the incoming one by D. The auxiliary rope is represented by E, and its side-bearing sheaves are also shown.

Outside, the most prominent feature of this building is the chimney, which forms an important landmark, and is next to the largest on the coast. The base is nine feet below the level of the fire-room floor, so that it is about twenty-four feet below the surface of the ground. The foundation is thirty feet square, battering in one inch to the course until it comes to sixteen and a half feet square, where the flue enters. Then it goes up to the water table, about ten feet above the surface of the ground. For the rest of its hight the chimney is in the form of an eight-cornered star. The inside is a circle seven feet six inches in diameter. The top of the stack is 175 feet above its foundation, or 166 feet above the fire-room floor. It was necessary to have this very high stack not only for good draft, but also to deliver the products of combustion high up out of the way. We give an engraving showing the exterior of the engine house.



ENGINE HOUSE OF THE MARKET STREET CABLE RAILROAD.

The Engines.

The power for the road is two pair of engines, with cylinders 34x48 and 24x48, a large and small one being compounded to work in pairs. The expansion cylinder has a capacity of double the initial cylinder. They are compounded by direct connection between the bottoms of the large and small cylinders. There is no extra receiver, the pipe answering as the receiver. Only one pair run at a time, the other pair being spare engines, to use in case of breakage of the others. These engines have Scott pillow-blocks, and the O'Neill cut-off, with automatic governor. They were made by the Union Iron Works of this city. The engines are well made, and are doing very satisfactory work, the cards showing great efficiency.

Each pair of engines furnishes 400 horse-power in ordinary working, and is capable of working up to 700 horse-power. The pinion on the engine-shaft is 4 feet 1 inch in diameter, and 20-inch face. It connects with a spur-wheel 12 feet 6 inches in diameter and 20-inch face, which in turn meshes with another spur-wheel of same size. Each spur-wheel shaft has two reels for the rope. The engines are set in pairs 19 feet apart. The diagram given shows the position of the engines with relation to the reels, guide-pulleys and tension apparatus. The steam pipes for the engines were furnished by W. T. Garratt & Co., of this city. The exhaust pipes were made by H. W. Rice, manufacturer of portable engines and boilers, in this city, and a very satisfactory job he made of them.

The boilers in use are the first of the Babcock and Wilcox type ever put up on this coast. They came here all built and ready to put up, and are guaranteed to be of 250 horse-power for each section, there being four sections. These boilers are very substantial looking structures. There is a Llewelyn water-heater, 5 feet in diameter, and a fine pair of the Dow steam pumps, made in this city.

The Driving Arrangement.

The driving method is what is known as the American method of driving, and is about the same as that used on the "Gordon Plane" in Pennsylvania. The engraving shows the general arrangement. Two pulleys, H H, 12 feet in diameter are placed in line. The rims are loose, and in between these rims are bolted blocks of wood, two inches thick and set on end. Maple is used here, but beech is supposed to be better. The rope passes in from the street on a slight downward incline, just clearing the top of the forward driver, and passing on to the top of the rear one (or that next the engine, K). It passes three-quarters of the way around, and thence upward, diagonally forward, over the top of the forward one, then down and backward, just clearing the bottom of the rear one, to the tension pulley, M, on the stretching carriage. There are only three-fourths of a turn on each of these drivers, or one turn and a half in all.

Yet this drives 24,000 feet of rope with heavy loads. One would hardly suppose that mere friction of the rope would admit of this, but that it would slip. The tension apparatus is the secret of this result; without that it would be impossible. The automatic action of the weighted tension pulley, however, is such as to keep the rope closely jammed on the driving pulleys, so that it is not easy for any slip to occur. The great advantage of this method is the small number of wraps on the drivers, as wraps on drivers form one of the principal sources of breakage and wear on cables. The improvements on the old English system (where numerous wraps are used) patented by S. B. Whiting in 1876-7, and used on the Brooklyn bridge, are unsatisfactory, for this reason: the friction wheel from which the power is derived, located in line between the shafts carrying the driving drums, relieves the bearings, but the old and principal fault of the wrapping of the rope still remains. As the part of the pulleys where the rope first comes on wears the most, the driver is not kept of uniform size. Therefore, the rope has to "overhaul" to compensate for difference in circumference between the sides of the driver where the rope comes on and goes off. This overhauling throws excessive strain on the rope, and soon breaks or tears it to pieces. By the system we have described as in use here this objection is overcome, the rope nowhere taking a complete turn of any driver. In the engraving F F shows the Market street cable; O O the Haight street angle sheaves; P P the Market street angle sheaves; and S the cars on the tracks.

On the same shaft carrying the drivers are large gears, of about the same diameter as the drivers, operated by a spur on the engine shaft of one-third their diameter, so the engine makes three revolutions to one revolution of the drivers. V-teeth are used on these gears, and they are four and a half pitch and eighteen inch face. There are four sets of these drivers for the four ropes, but one set of gears and one pair of engines operates them all. The other pair of engines is held in reserve as a spare set in case of accident.

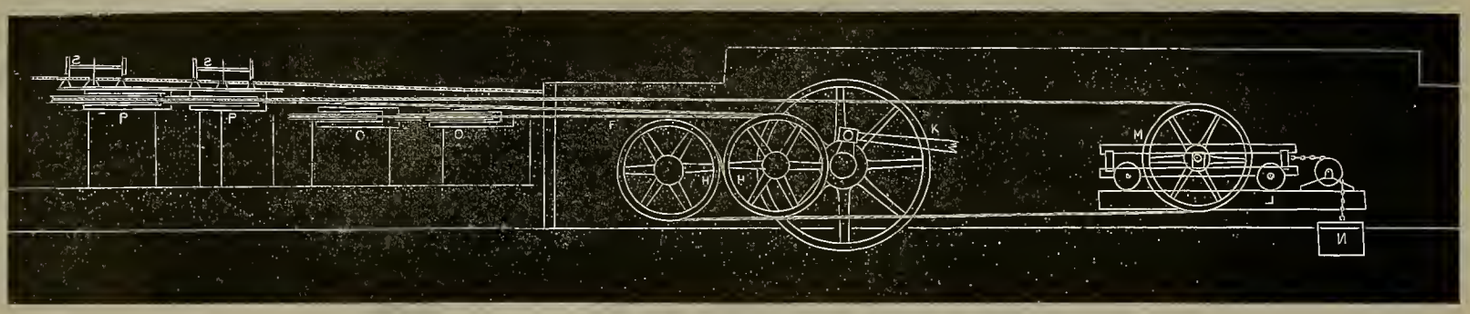
The Stretching and Tightening Arrangement.

The tension of the wire rope on all these roads is something which has to be provided for, otherwise there would not be a uniform tension maintained. Moreover the change in length, with the ordinary changes in temperature, during the day and night, of 24,000 feet of metal cable, must also be looked after. On a hot day the cable is several feet longer than on a cool one, and this ever-varying change in length must be compensated for, and the apparatus for doing this must be automatic. The rope is furthermore continually lengthening by wear, and during the life of a rope the total stretch is about one per cent of its total length. The method in use on this road is considered to be the best known. Of course each rope has to have a separate stretching and tension arrangement. The principal object in keeping the uniform tension is to prevent the rope slipping on the drivers, it being driven merely by friction. Behind the engines in the engine room, and in line with the driving pulleys, brick-lined excavations 165 feet long each and five feet wide and deep have been made, one for each cable. Over each one is a stretcher arranged for a separate cable. A description of one will serve for all. A large and heavily framed carriage, L, mounted on wheels and moving on tracks, is placed over the excavation. A pair of tracks, close together, is on each side, and each pair forms a rack-bar, with which a pawl on the carriage engages. These pawls prevent the carriage moving forward, as the strain of the cable tends to make it. On top of this main carriage is a smaller one, also on rails, the rails being on the main carriage.

The small or supplemental carriage carries a vertically revolving pulley, M, about thirteen feet in diameter. The cable or rope, after it passes around the main drivers of the engine, extends back around this pulley on the carriage. A very heavy weight, N, hanging on a chain and connected with the supplemental carriage, passes over a chain wheel on the lower carriage, and draws backwards on the upper one, thus keeping a constant tension on the cable equal to one-half the amount of the weight, the strain being divided between the upper and lower ropes. This tension pulley prevents any slipping of the cable on the drivers, as elsewhere described.

The function of the lower carriage is to take up the permanent stretch of the rope. When it is found that the weight is settling down into the pit, it is known that the cable has permanently stretched. Then the lower carriage is moved back, and the pawls are dropped into the ladder formed by two T-rails with pins through the webs, forming a sort of rack bar, thus holding the lower carriage in its position. This moving of the lower carriage is accomplished readily, notwithstanding the strain of the cable, and without necessitating

the slowing of the ropes or interfering in any manner with the operation of the road. A heavy tackle is hooked to the rear end of the carriage, and the tail rope or hauling part is taken to a spindle on the end of the axle of the main sheave on the supplemental carriage. This is revolving steadily all the time, and by taking a few turns of the rope, the tackle is operated by the power of the cable itself, and the carriage hauled back on its rails, the pawls before described automatically engaging with the teeth or pins provided for them, thus holding the carriage at the desired point. As the lower carriage moves back the weight rises and the upper carriage remains stationary, but changes its position with relation to the lower one. That is, when the lower carriage is drawn back as far as desired, the supplemental one is at the front end of the lower one ready again to be moved back automatically by its compensating weight. By the arrangement described 330 feet of each cable can be taken up.



SECTION OF ANGLE SHEAVES, DRIVERS AND TENSION APPARATUS.

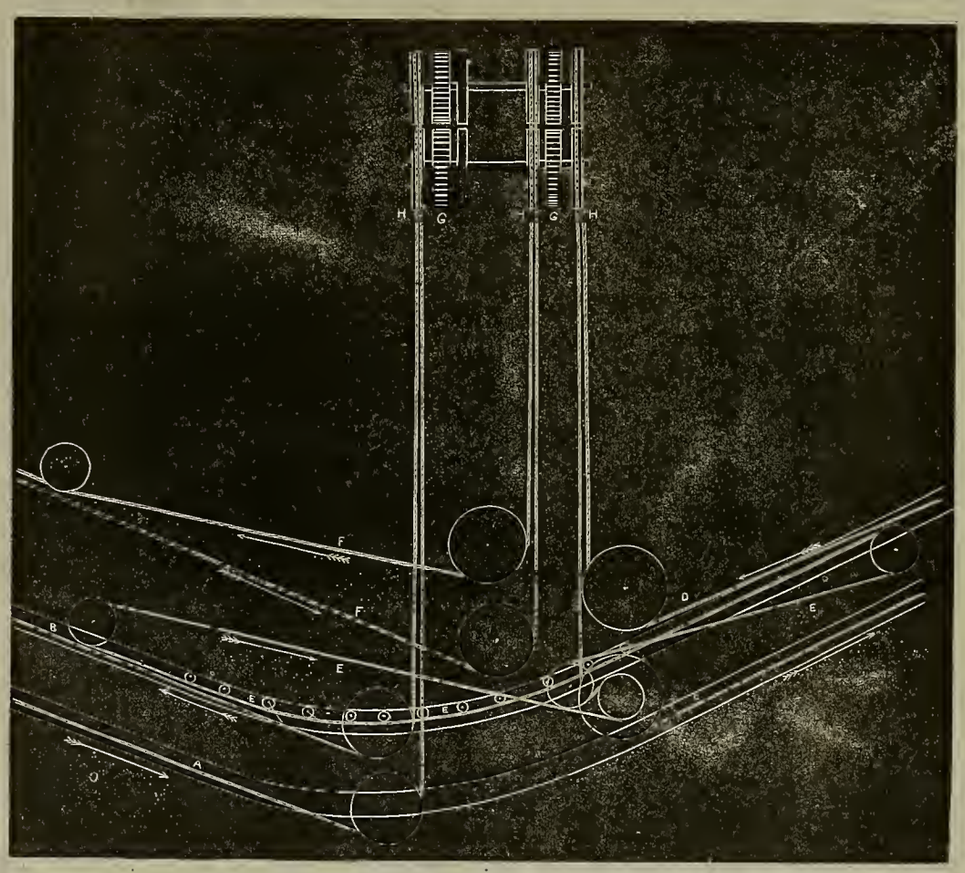
The Wire Cables.

The wire cables in use by this company were made by John Roebling Sons Company, of Trenton, New Jersey. The rope is an inch and a quarter in diameter and weighs 2½ pounds to the running foot. It is made of crucible-steel wire. There are six strands of nineteen wires each around a manilla rope heart. The main or Market street cable is 24,125 feet long; the Valencia street is 20,194; and the Haight street 20,002 feet long. The McAllister street cable, from the engine house at Masonic avenue to Market street, is 20,489 feet, and from the engine house to the western terminus at Fulton and Stanyan streets, 6,000 feet. The last two are the same kind of cable as the main line, but made by the California Wire Works of this city. The cable is lubricated entirely with castor oil. Tar is first used to fill up with and castor oil is added as the rope fills, until it alone is used. They have to avoid the use of tallow and other animal fats.

The Cars.

One of the questions in connection with the new road which was most carefully considered was that of the construction of the cars. It was known that the traffic would be heavy at certain hours, both morning and evening, and that the ordinary form of car and dummy was not entirely satisfactory. Moreover, in changing a street road operated by horses and having the usual large stock of common four-wheeled cars, to a cable road, several things had to be taken into consideration. The outlay for reconstruction must be large in comparison with the original cost of the road, and as the total cost of the cars is but a small percentage of the whole, the car must be so constructed as to fulfill the following requirements: 1. To be as safe as possible for the public; 2. To ride easily, either empty or loaded, and carry large loads if required; 3. To be easy to get on or off, and neat and symmetrical in appearance; 4. To be cheap in first cost and maintenance, and so arranged that old horse cars can be converted to cable cars without great sacrifice to property. All of these requirements seem to be fulfilled in the combination car in use on the Market street road.

The cars and dummies on this line are made in one. They are different from any previously made, being entirely original in design. They have more the character of a steam than a street car, as the engravings show. The whole car is thirty-four feet long, and weighs 9,600 pounds. The forward part, for a distance of fourteen feet, is open all around, but has a roof supported by ornamental posts. In the center is the brake and grip mechanism, and the engineer or dummy man stands isolated in such a position that he can see ahead and on both sides. There are two front seats on each side, but the center is open in front, so no passenger can obstruct the view. The seats on the side are wide and comfortable, and set back so the passengers' feet are inside the line of the sides of the car; they are completely protected from passing vehicles by four strong posts. They are high up, also. Outside is a broad step running lengthwise the car on each side, and on these many can stand and hold on by the strong iron vertical hand-bars shown in the engraving.



PLAN OF DRIVING DRUMS, ANGLE SHEAVES AND CABLES.

The object of arranging the seats so that the passengers may sit with their feet inside the line of the side frames of the car, is to avoid liability to accident. In case of a wagon being backed against the car, or striking it in any way, the passengers are up out of harm's way. The height of the seat takes them up out of the dust also. The whole arrangement of these cars has proved highly satisfactory to the public and to the company. They carry large loads of passengers, run smoothly, and round the curves readily. They are, moreover, handsome in appearance. They are constructed in such a manner as to combine great strength with lightness. A noticeable feature is the absence of any jogging or jarring motion ordinarily incident to dummies. Market street being the main thoroughfare in the city, it was absolutely necessary to make the cars safe. It is easy to get on or off, by reason of the many posts and handles for support.

There is no communication for passengers between the car and dummy, and people can not come out of the front of the car to alight. Most of the old street cars of the Market street line have been utilized by an open portion being built on though unless it was pointed out, the connection would not be seen. The front platforms are removed, but otherwise the cars are not changed. These cars are light and well ventilated, and their interiors are all of bright varnished woods, with wooden perforated seats. The car body has each end supported on four wheels, united by a frame or truck having a pivot or swivel, so that the trucks may turn and accommodate themselves to the curvatures of the road, as on ordinary passenger coaches. The grip is mounted on the solid truck of the forward or open portion of the car, an opening being made in the floor for it to project up through. As the distance between the pairs of wheels on the truck is small, the movements of the truck in accommodating itself to the curvature of the track are small, and do not affect the grip. The long car-body can make long and sweeping curves, necessitated by its length, very readily, as the two trucks so widely separated are each on pivots, like the trucks of steam cars. The rigidity of the ordinary street car running gear is avoided, and there is no "grind" on the rails. It is the first time this system has been applied to street cars. The length of these cars necessitates some better form of running gear than that in ordinary use, so the system described was adopted.

The cars ride smoother than any horse car in the city, there being none of the jolting motion so common. The road-bed is so solid and the rails so well joined that the whole road is smooth. The cars are well lighted by end and center lights, and brilliant head-lights are used in front, which light up the street far ahead. There is a large gong outside and on top of the car in front, which, while it sounds a loud alarm, is not heard so much by the passengers as by those it is intended to warn. The engineers and conductors are uniformed neatly; and during the hours when crowds prevail, there is an extra conductor or collector put on the forward car.

It is a mistaken idea that these cars can run no slower than the cable. By reducing the grip pressure, by means of the lever, the cable slips along and the car does not move so rapidly; in fact, it may be slowed to a snail's pace, almost, while waiting for a team to get out of the way; and the starting up is so gradual that no jerk is felt.

Among other peculiarities in the construction of the cars is that of the fender or "kid-catcher," for picking up any stray youngsters who may fall on the track. It will not do to put a fender or catcher on the car itself, as the car has a considerable range of movement from variable loads and the plunging motion caused by inequalities of the road. The fender can not be, therefore, readily carried at a fixed distance from the ground.

The method adopted is to secure to the forward edge of the rigid truck frames in front of the wheels a plank or frame extending in front of the car itself. It extends across the whole width of the car, and is not over two or three inches above the surface of the track. Knees or braces secure it firmly to the truck frame. The front edge is rounded. The construction of this part of the car is such as to lessen danger in the case of persons falling in front.

We give herewith two engravings showing the details of the running-gear of these cars. The rear truck carries the track brake, which is between the wheels on each side. In addition there are the usual wheel brakes. The forward truck carries the grip and brake levers. A rod connects the rock-shaft of the track-brakes with the hand lever on the front truck. It will be seen that these trucks are similar to those in use on steam railroads, and that they are connected by a single king-bolt or pin with the body of the car. We stated elsewhere that by the use of these trucks the cars turn the curves easily, and ride without jolt.

The Brakes.

The brakes used on these cable railroads are very important factors in the safety of the system. On this road, particularly, running at the speed it does and through a very crowded thoroughfare, it is necessary to have the brake gear

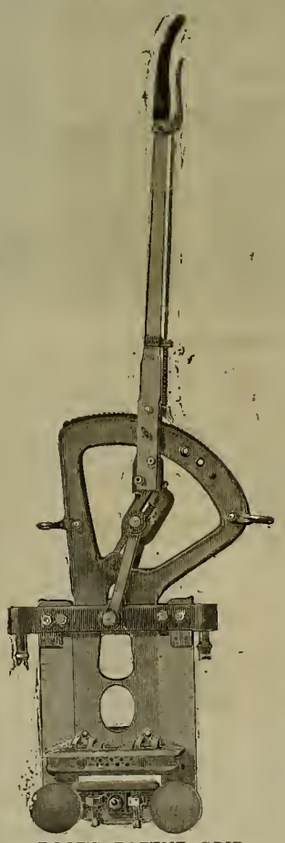
very efficient, in order that sudden stops can be made. It is found in practice that one of these cars, weighing 10,000 pounds, and loaded at that, while running at a speed of eight miles an hour, can be stopped in ten feet. Even air-brakes could not heat this. While the ordinary brakes are attached to the wheels in the usual way, one set for the engineer and one for the conductor, each set acting independently, the main dependence is placed on the track brake.

These track brakes are the outgrowth of the cable railroad system, being adapted for use on very steep grades, where if the wheels were locked, even, the car itself would slide on the rails. It is a very powerful appliance, and by its means one of the heavily loaded cars may be stopped very suddenly. In the first place it may be stated that both the wheel brakes and track brakes are entirely independent of the car body, the whole mechanism being on the trucks, or running gear. The track brake is on the rear truck, as the engraving shows, between the wheels, its operating lever, however, being under control of the engineer or dummy-man who handles the grip.

Under the car is placed a rock-shaft, operated by the lever, which works toggles or knee joints, forming a powerful pair of levers, which press down on each track a broad block of wood. The weight of the car can almost be lifted on these blocks, so powerful is the leverage. The device is very effectual, works quickly, and is not liable to breakage. It is operated by a hand lever The ordinary wheel brakes are controlled by a foot lever near the engineer, so when the grip is released he can slow down with the wheel brakes or stop suddenly with the track brake. In addition, the conductor can operate the wheel brakes on the rear part of the car. The engineer can throw down the track brake on the rear part of the car and lock the four wheels on the forward part at the same time.

The Grip.

The most important appliance on this class of roads is the gripping attachment, or grip, by which connection is made and unmade between the cable and the car. It is necessary to have a gripping apparatus simple in construction, with as much as possible of its mechanism above ground, so as to be accessible at all times, and to be carried at a uniform depth below the slot, so as to always maintain its position relative to the slot. In these cars the grip hangs on the fixed part of the truck, and not on the car itself. The truck is like that of a coach. The grip is between the center bolster and the forward axle of the truck, and there is but little motion to it, as the dummy man who operates it stands directly over the king-holt, around which the truck is free to swivel.



ROOT'S PATENT GRIP.

The grips of these cable roads are as much a mystery to most people as a steam engine. Men ride behind locomotives and on steamers every day who have no definite idea of the power that moves them. They ride on cable cars day after day and year after year, see a man use a lever to stop and start, but beyond knowing that something "grabs" the rope, they are in the dark. To describe in detail the operation and construction of a grip would puzzle nearly all. Yet the operation is quite simple, now the idea is worked out, though the problem had many difficulties which only experience and ingenuity have been able to overcome.

The grip in use on this road is one invented and patented by Mr. Henry Root, the engineer and superintendent of construction. It is formed of two frames, one sliding outside the other. The outer one is secured to the grip-bar of the dummy (or forward part of car) by bolts, and carries the lower jaw, while the inner frame, which slides up and down upon the outer one, carries the upper jaw, the quadrant, the operating lever and adjusting mechanism, and is held in place by guide plates extending across the stationary inside frame, and between which it slides.

The frame carrying the jaws passes through the slot directly down alongside the cable, without offset. The grip-bar on which these parts are mounted is secured and supported by a frame on the running gear or truck, and not on the car itself. The car body can therefore be mounted on springs without any of the spring motion being imparted to the grip and through it to the cable. In the way in which this grip is arranged, all the parts liable to get out of order are accessible, and it is not necessary to provide pits in which to examine them. The engraving given herewith shows the construction of the grip.

ROUTE OF MARKET STREET CABLE RAILROAD.

When the car is at a standstill, the wire cable passes along over the chilled-iron grooved rollers at each end of the lower die. The lever operating the grip is then inclined forward. When the engineer desires to start the car he moves the hand lever back. This action moves the inner frame downward, carrying with it the upper jaw or die. This die consists of a hollow piece of soft cast-iron secured in the lower end of the sliding part. The lower die is a shorter piece of soft cast-iron fitted lengthwise between the two rollers. This is arranged with set screws to be raised to take up wear. The upper die is longer than the lower, and as it is forced down by the inner frame it rests on the moving cable, and pushes or presses it tight on the rollers before pressing it on the lower die. Gradual motion is thus imparted to the car, without jerk or jar. A still further downward motion of the upper die forces the rope or cable on to the lower die, the cable being thus held tightly between the dies. A reverse motion of the lever raises the frame and upper die, and releases the cable and allows it to run through freely without imparting any pressure to the car. The brake can then stop the car. The head of the toggle operating the inner frame slides up and makes a difference in the length of the link, so that wear of the upper die is accounted for. Wood has been tried for the dies, and so has brass, but soft iron is found to be as good. The dies are easily changed. The frames of the grip are made of steel, from the Judson Iron and Steel Works in Oakland. Phosphor bronze was found to be too soft. Steel seems the best. They have been made of common cast-iron, but this is too brittle, as a blow may break it. The first thing to suggest itself would be wrought iron, but there are several objections to its use. It is more expensive than a casting; and its liability to bend is a serious objection. While the material must necessarily be tough and strong, it is better that it should break than bend under any severe strain, since it is preferable to lose a grip than to have to endanger the tube, cars or passengers. The law prescribes that the slot in the street through which the grip passes must be no more than three-fourths of an inch wide, so it will be seen there can be no spare metal, for there must be some play. This grip works very satisfactorily indeed. The grips were manufactured in this city by William H. Birch, of the California Machine Works, as were also the sheaves and tighteners.

Construction of Road-Bed.

In laying out the plans for this line the experience of other cable roads was carefully considered, with a view, if possible, of providing against difficulties formerly met with. Every detail was studied with the utmost attention. The constructors had themselves built one successfully operating cable road in the city, and were fully acquainted with the requirements. Cable railways are ordinarily constructed of iron ribs of the form of the tube, set at suitable intervals, to which the slot iron or timber, as the case may be, is bolted, and the spaces between these ribs filled with wood to form a continuous tube. Outside and independent of this tube the rails are laid, supported on

short ties or other foundations, and connected horizontally with the iron ribs by short bolts or rods, but are liable to settle by the undermining of their foundation without regard to the tube or the other rail of the track. This will frequently occur by the renewal of the paving outside of the track, the introduction of house-connections with the main sewers, or other disturbances of the track. This settling causes great inconvenience.

It was determined, in building this road, to form a single rigid structure, by connecting the rails and slot-irons by yokes, and uniting the whole by employing concrete.

The engravings show plainly how the road-bed has been made. The main tie or yoke connecting the opposite rails is formed of old railroad T rail, bent in suitable shape, head down. It embraces the tube, and has fastened to the ends suitable chairs or plates to which the rails are secured. From the lower part of the curved yoke extend upward two supports for the slot-irons. The lower ends of these are sufficiently separated to form the necessary width for the tube.

Tie-rods connect these supports with the main yokes through the chairs. The two rails, slot-irons and yoke are then all connected rigidly together as one. These yokes are placed every three feet along the length of the road. The rails and slot-irons being connected in the same structure, all the parts are maintained in their relative position. Whatever may occur to alter the place of one has no effect, unless the change is sufficient to effect the whole structure.

In building the road, the first thing done was to excavate places every nine feet, in which was constructed a concrete pier sixteen inches thick by five feet long crosswise the track, on which the main structure stands.

There are altogether some 9,000 of these piers, the foundation of which are 10 feet below the rails. For a number of blocks at the lower end of Market street the street is "made ground;" that is, it has been filled in on to the hay mud. In order to get a solid foundation, piles had to be driven to support these piers, so all tendency to settle was avoided.

The piers being built and the trench dug, a section of rail and slot-iron was put in place on the piers, and concrete filled in, filling the space between the rails and slot-iron, and forming a support for the iron-work.

The concrete was not filled in the center, but a core was temporarily used, so the tube or rope-way was thus formed between the slot-iron supports. As nearly all the weight of the traffic is on the rails, the tendency of the rails to go down is resisted by the deep girder of which the bent tie forms the top and this continuous mass of concrete the bottom. There is no danger of unequal settlement. We give an engraving which shows a section of the road-bed with these piers. The soil in which the road is built is sandy.

In building this road, over 40,000 barrels of Portland cement were used for the concrete. There were 25,000 ribs or yokes used, also. Of the steel channel-rail that forms the slot, about 1,000 tons were consumed.

The form of this slot-iron is peculiar. It is not an angle iron in the ordinary sense. The top part is 2¾ inches wide and the inside or lower portion is 5 inches deep and ⅝ of an inch thick below the fillet. It is bolted on to the upright of the ribs. The upright parts of the two slot-irons are wider apart at the bottom than on top. The edges of the iron are ¾ of an inch apart at the top and 5 inches at the bottom, although only 5 inches deep, the slope being divided between the two. They slope back almost two inches in five. This gives room below for the straps on the grip.

By building the whole road on piers a very firm foundation was obtained, and chance of any settling obviated. If the street was dug away this structure would remain on its 9,000 piers, like one of the old aqueducts. A double purpose was served by this. People wanting to make sewer connections or connect with water or gas pipes can do so without disturbing the road. They run all such connections between the piers, and even if careless workmen fail to make all solid again, the road does not suffer.

The Rail.

The rail used on this road is peculiar in shape, and is the same put in the California street railroad in 1877. The form was made specially for that road, drawings being furnished by the constructors to the Cambria Iron and Steel Co., of Johnstown, Penn., who made the first lot. Those on the road under consideration were made here by the Pacific Rolling Mills, from imported Bessemer-steel blooms. The rail weighs 38 pounds to the yard. It is a sort of combination T and street-car rail, the object being to get some thing that could be secured with a fish-plate joint. The rail is 3 inches wide, 2 inches of face, and 1 inch of inner flange. It is 3 inches high. The main peculiarity is in the inner part of the T being dropped down to form the flat flangeway for the car wheels.

Supporting Pulleys.

Every thirty feet along the road is a grooved supporting pulley. These form the carriers for the rope. The pulley for this purpose is a solid casting, axle and all. It is 15 inches in diameter over the flanges, and 13½ inches in diameter to the bed of the groove where the rope bears. The axles are 1¼ inch in diameter, and 12 inches long. The bearings are 2½ inches long. A flange, or rib, is cast on the axle to prevent end motion, and it runs in a corresponding groove in the box. The box in which each bearing sets is a lignum-vitæ block, set in a cast iron shell which carries the lubricant. That used after comparative test is the Standard Lubricating Compound, made by the New York Refining Co. The shells fit in a cast iron frame, which rests on a small brick foundation in the tube or rope tunnel. There are two side walls that the edge of the frame rests on, leaving a clear passage-way under the pulley of some three inches. Each of these supporting pulleys weighs about 40 pounds. They last a long time and are seldom broken.

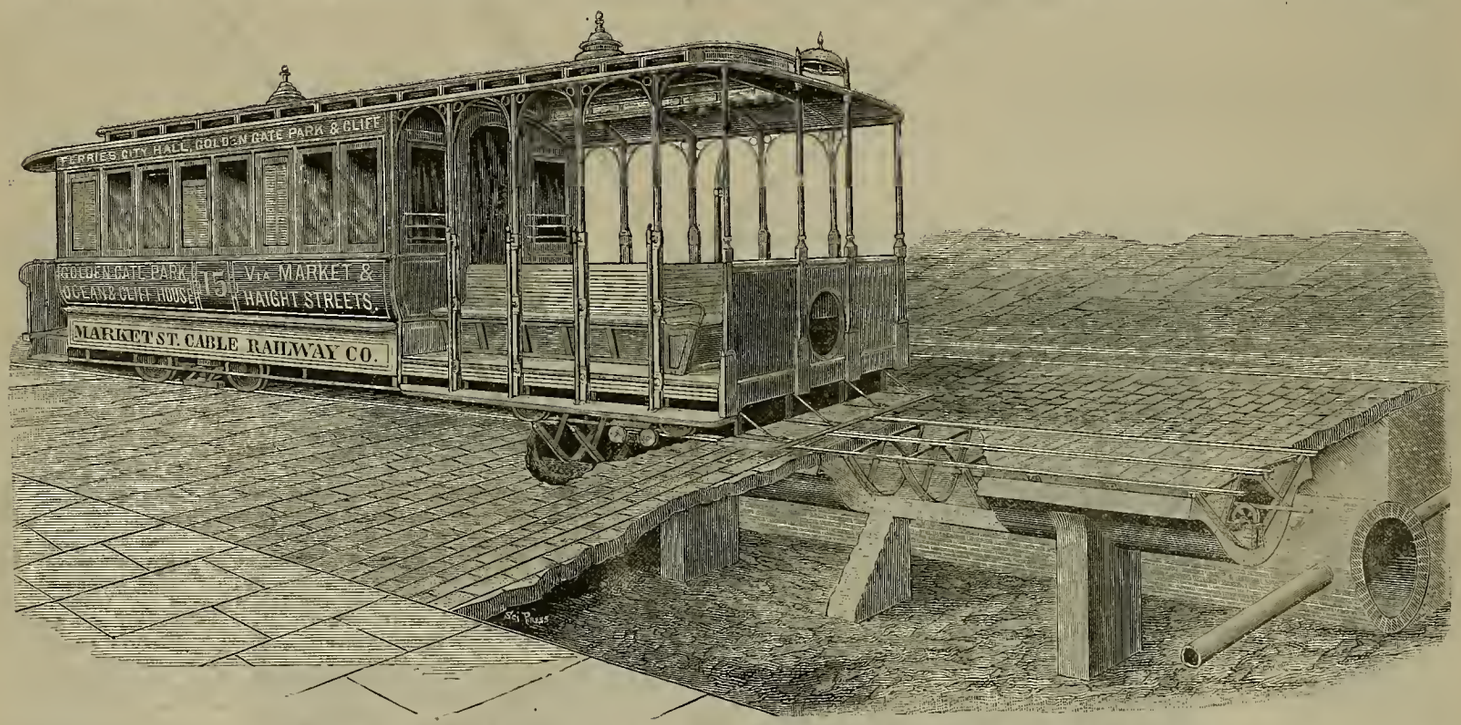
The Pulley Plates.

It is necessary to have these pulleys readily accessible, so, over each one is a removable plate, which it took some ingenuity to devise, since the plate must be secure in its place, must form no obstruction to traffic, and stand heavy blows, and at the same time must be constructed so as to be taken up readily for oiling the pulley and cleaning the ropeway. The plate is twelve by sixteen inches and of flat three-eighth wrought iron. On the under side, running lengthwise the center, is a channel-iron truss for the truss straps, three of which cross it. One end of this channel-iron truss projects past the plate and nips into a recess in the cast iron frame. The other end comes flush with the plate, and a cast iron hook or dog drops or latches into the recess formed by the channel iron, and holds the plate in place. The latch or dog has a weight formed on it, and hangs in the cast iron frame out of the way under the pavement. It is automatic in its action, and can not be disengaged by accident. The top of the plate has numerous rivet heads to roughen it, and secure the truss and straps. The plate is subject to very heavy blows, so no rings or loose lifting arrangement can be used. Two holes are bored in the plate by which the hook is disengaged and it is lifted. The pulleys can then be oiled. The tube is also cleaned out through these openings. A man with a peculiarly shaped shovel or hoe, operated through the grip-slot, pushes the dust and dirt to the opening, where it is readily removed. These plates, complete, cost about $2 apiece.

The Depression Pulleys.

It must be remembered that in these cable roads, in addition to the supporting pulleys below, which prevent the rope sagging, there must be also pulleys provided at the crossings of upgrades, to hold the traveling cable down below the surface of the street and within the tube. These pulleys, being above, would necessarily be in the way of the grip on the car, which is also above, if provision were not made to let the grip pass. This is by no means a simple problem, and more or less trouble has been experienced with those in general use. The depression pulley mechanism on the Market-street road, the first of its kind used, has answered the purpose admirably. The depression pulleys are usually common pulleys, upon the under side of which the cable passes, and which are placed to one side and passed by a peculiar grip, or adapted to move in some manner that the grip may pass, and then return to position. The method used on the first roads constructed here was to place the cable some distance to one side of the slot in which the grip travels. The grip was then made L-shaped, so as to enable the shank to pass the depression pulleys as the cable was carried by the grip at a fixed distance below the surface of the track. As the grip approaches these pulleys the cable is pressed down clear of them, and the shank passes to one side of the pulley, the L forming an offset. This method is objectionable because the draft is to one side and causes a twisting strain on the shank. A grip with no offset, and passing down vertically without angle, can not pass depression pulleys arranged in the ordinary way. A different plan was therefore necessitated on this road.

At the proper position under the roadway is placed a horizontal arm, one end of which is pivoted or swiveled in a suitable manner near the slot-opening, and the other end of which carries a pulley. This is the depression pulley, and holds the cable down. A counterpoise or weight keeps the arm and pulley in its place with relation to the center of the slot and over the cable. As the car comes along, the grip of course holds the cable down so as to press it out of the groove in the pulley. This leaves the arm carrying the pulley free to swing aside but that it is held by the counterpoise. The shank of the grip, however, begins to press against the side of this arm, near its hinged end, and without jar or shock presses the arm and pulley aside. The instant the shank has passed, the counterpoise brings the arm and pulley back to its central position again. As the car goes on further, the rope gradually swings back up to its normal position and comes into the groove of the pulley again. The frame or arm carrying this pulley is set at a small angle to the plane in which the grip-shank travels, and if any part should become broken, the weight or counterpoise draws the pulley and frame out of the way out of the line of travel of the shank, so there is no danger of any obstacle in the line of travel of the grip. There is no spring to get out of order in this arrangement. It must be remembered, of course, that cars can go only one way on the respective tracks of these cable roads, the cables running up one track and down the other. The grip always comes one way, and as the arm is set at an angle with the slot and partly crosses it, the grip shank must come in contact with it just at the right time and push it aside. The arm is about six feet long. This is an ingenious arrangement, and is at the same time both simple and effective. We have now to consider the method of



SECTION OF ROAD-BED SHOWING FOUNDATION PIERS, TUBE, ROOT'S PATENT CAR, ETC.

Rounding the Curves.

There are several mechanical difficulties to be met with on the curves of cable roads, especially where they have to pass around those of ninety degrees or more, with a radius now commonly used in cities with narrow streets nearly or quite at right angles with each other. The means used for rounding the curve on the Market street road are different from those applied anywhere else, and deserve some detailed description. The curve on this road where the new system is applied is at the junction of Market and Valencia streets, in front of the engine-house.

The main feature is in the use of an auxiliary cable in the curve on the line of the grip-slot running at half the speed of the main cable. The two streets named do not meet at right angles. The Market street cable passes around its guide sheaves into the engine-house, and that of Valencia street does the same. Between the end sheaves of these respective cables plies the auxiliary one which carries the cars from one to the other.

This auxiliary cable is driven from a six-foot, V-shaped iron wheel on the engine shaft. Guide pulleys suitably placed lead it out into its tube or rope-way, and back again.

In the curve it is guided by 15 side-bearing coned pulleys. The bases of the cones are downward, so that when the cable is within the jaws of the grip it is opposite the upper part of the conical face, and there is sufficient space for the grip to travel without touching the sheaves. When the cable is released from the grip it may settle to the lower or larger portion of the sheave-face. The auxiliary rope is 400 feet long, and the curve has 80 feet radius and about 55 degrees of angle.

The diagram showing the plan of engines and the guide-pulleys of the various cables shows also the position of the auxiliary cable and its side-bearing pulleys. By examining this it will be seen that the auxiliary cable only runs between one pair of tracks, and propels the cars only from Valencia street around the curve into Market street. It happens that at that point the grade is such that the cars coming from the ferry, when they let go the Market street cable, will run by gravitation around the curve to the point where they can take hold of the Valencia street cable.

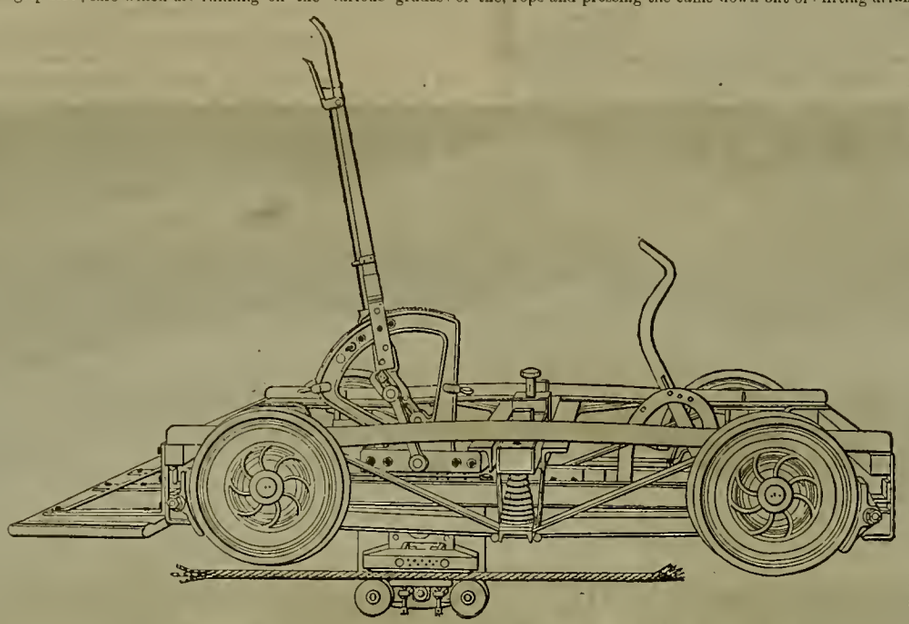
The diagram shows the auxiliary rope driven by the cable but the plan is not used. It is driven from the engine shaft.

On the return, however, they are on the up-grade, and there the auxiliary cable comes into play. A slight bend or turn in the track out of its regular line swings the car and grip to one side, so that the cable passes out of the side of the grip from between the jaws. The momentum of the car carries it on a few feet to the point where the auxiliary cable is running, and this cable passes into the side of the grip, the jaws of which are open to receive it. By the proper movement of the lever by the dummy-man the grip-jaws close on the cable, and the car is drawn around the curve. As it reaches the end of the auxiliary rope, another curve or swing in the track swings the grip away from the rope, the jaws being opened for the purpose. The momentum of the car carries it a few feet, to the point where the grip may take hold of the main-line cable, and continues on its way. The cars have only a space of about eight feet to travel by momentum. The distance they travel on the auxiliary rope is about 120 feet.

At proper points on the roadway are iron plates with block letters, with the words "let go," "stop," etc., so the engineer will know exactly where to manipulate the grip and brakes. At night the big headlights show these plates plainly.

Experience proves that it is impracticable to move cars around short curves at the same rate of speed at which the cable should travel on straight lines, as the sudden change of direction would have an unpleasant effect upon passengers. This auxiliary cable travels four miles an hour just half the speed of the main-line cables.

The tension of this auxiliary cable is much less than that of the main cable, as it only has to move one car at a time around the curve, while the main cable has the strain of all the cars which are running on the various grades of the whole line. The tension being so much less, it is easy to relieve the grip from side strain and prevent undue friction and wear in passing curves.



ROOT'S PATENT FORWARD TRUCK, WITH GRIP, BRAKE LEVER AND FENDER.

Switch and Safety Arrangement.

Just before the curve at Valencia street is reached, the cars which are to go out the Haight street branch switch off from the main line to the right. There the Market street cable has to be dropped while the car goes around its curve in switching on to the Haight street cable, which, as before explained, is a separate rope entirely. The switch is so arranged that not only the rail but the grip-slot is set for the car as it goes around the curve. It was found that sometimes the dummy-men were careless, and did not let go the cable in time, so that as the car started around the curve the cable kept carrying the grip straight ahead on the main line.

The consequence of this, as might be expected, was a broken grip, and sometimes a cut cable. It would not do, therefore, to trust entirely to the dummy-men at this point, and arrangements had to be made to provide some sort of safety apparatus, so in case the cable was not dropped no breakage could occur.

A switchman stands at the switch, to move the lever which throws over the guide-rail and slot-iron for turning the car off the main track. The same movement that does this also works the safety apparatus, some 30 feet away.

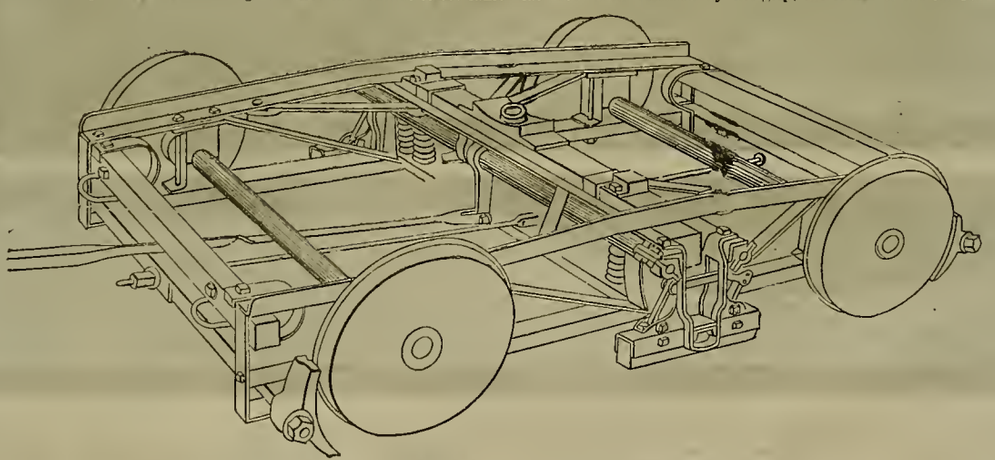
Connected with the switch-lever, by bell-cranks, is a long shaft. On the side of this is a pin carrying a roller 6 inches in diameter and 8 inches long. This shaft is at one side of the rope tunnel or tube. The roller stands in an upright position—to one side and out of the way of the main-line cable and grip—when the Haight street switch is closed. The main line is then clear for the passage of the grip, without releasing the rope. When the switch lever is moved, however, the shaft is revolved by the same motion, throwing the roller down on top of the rope and pressing the cable down out of its straight line. The top of the roller is then lower than the bottom of the grip, so the grip is free to pass over it provided it, has released the rope.

When the car comes along, if the grip has dropped the cable it passes on around the curve all right on to Haight street, on a slightly descending grade. In case, however, the cable has not been released by the grip, the cable draws the roller up and revolves the long shaft which swings the bell-crank on the switch end of it, closes the switch, and compels the car to keep the main line. Of course then no grip can be broken, because the car keeps on the same line as the cable. The car is then stopped, backed up, and moved around the curve, where it should have gone in the first place. The fact of it having gone on down the main line is of course proof that the dummy-man neglected his duty, and several repetitions would prove his inefficiency and cause loss of position. It makes the men careful, therefore, at this point. Still, the safety arrangement always stands ready automatically to correct any such faults, or at least to prevent breakage and detention.

As the cars return from Haight street to the main line they let go the Haight street cable, which passes off to the right around a guide pulley, crossing the street to the engine house. The car runs by gravity around the slight curve on to the main track. Here the main Market street cable must be picked up, and an ingenious arrangement has been devised for this also.

It will be remembered that the grip is a side-hold one; that is, the cable goes in at the side to be caught by the grip. Therefore, if the rope were raised up vertically at this point it would strike against the bottom of the grip and prevent its being raised.

The rope, of course, when dropped by the grip, falls into the supporting pulleys, which are below the level of the grip, so the cable must be raised until the grip can take it. The lifting arrangement consists of a cross of inch and a half gaspipe, one end of the head of which is hinged to each yoke of the road-bed frame. No guides are needed. The pipe projecting from the cross carries a conical roller six inches long, six inches in diameter at one end, and two and a half inches at the other. A chain from the end of this pipe comes up to the surface of the street. The conductor leaves the car and pulls on the chain. This raises the pipe and roller, and the conical roller striking against the rope not only raises it, but causes it to describe a sort of half circle, drawing it to one side, so that when all the way up it slides back, down the small end of the roller, into the side of the grip, between the jaws. It is then grasped by the grip, and the car goes on down the line. This arrangement answers the purpose perfectly, and is very convenient. The cost of construction was trifling.



ROOT'S PATENT REAR TRUCK SHOWING TRACK-BRAKE.

The Turn-Table.

At the ferry-house, foot of Market street, the cars are turned around, so the open portion carrying the grip will be ahead. This turn-table is on the wharf, over the water, and the large pulley around which the cable turns is just beyond it. A slight raise in the track is made at this point, so as to give a down-grade on the way back, for a short distance. As the car comes down the street the cable is released from the grip, by a slight bend in the track taking the car out of its line. The momentum of the car carries it on to the turn-table, which is 30 feet in diameter. There are four sets of tracks, one for the incoming car and three for the outgoing. The Valencia street car is shifted to its side-track, the Haight street car to its track, and the McAllister goes on a track prepared for it. These three outgoing tracks merge into the main line a short distance from the turn-table; but by having the three side tracks, the cars for the respective routes may follow each other quickly. Being on a grade, the cars are readily pushed to these tracks, and run by gravity a few lengths, to where they grasp the cable running up Market street. The grip does not have to be raised while the cars are on the table or side tracks.

There are two tracks on this table, so it can be turned and transferred by them at the same time. By having the double tracks, when one car comes on and is turned around, headed for its side-track, the other pair of tracks of the turn-table is in position with relation to the main track, so the incoming car can come right on. The table has, therefore, never to be turned back. Between both tracks there is a slot and tube-way for the grip, forming a continuation of the incoming and outgoing tracks, into which the grip passes, and passes out of the opposite end after the table is turned, the cable itself being dropped down and passing to one side of the foundation of the table.

The turn-table is revolved by the power of

the cable itself. Under the street is a four-foot wheel, in the center of which is a ten-inch wheel impinging on the lower edge of the turn-table. This is a paper friction wheel. On the street above a man operates a lever, which presses the moving cable on to the rim of the four-foot wheel, thus revolving it and the ten-inch wheel, and giving one-fifth the speed of the cable to the turn-table. The table can be thus turned round slowly, and stopped as desired. Dogs drop into place and hold the table opposite the track on which the car is to run.

The Depot and Car-Houses.

At the end of the Valencia street line is the fine large carhouse or depot, where the cars are kept at night. The structure is a very large one, 420 feet long by 100 feet wide, and two stories high. Great rows of "windows" and "sky-lights" make the building light and airy, and the company own ground around it so the light can not be obstructed. There are elevators for lifting the cars to the upper story, arrangements for shifting the cars on the numberless tracks, and all the necessary features for a depot. At the end of the line is a turn-table, and from it the cars run by gravity into the depot. They run out to the track again from the lower end of the depot.

The cars on the Haight street branch are housed in a depot for their special accommodation, on Haight street, midway between Shrader and Stanyan streets, about two hundred and fifty feet before the terminus is reached. The depot is a two-story structure—one floor only, however, having been built. Provision has been made for the second floor when required. There is a grade of three and a half feet in one hundred on the road at this point, so that the cars run by gravity from the main track into the house; and go out by gravitation, also, from the other door to the main track again.

The road was opened on the 22d of August last. The officers of this company are:

Leland Stanford, President;

Chas. F. Crocker, Vice-President;

J. L. Wilcutt, Secretary;

Henry Root, Engineer and Superintendent of Construction.

C. B. Gould, Superintendent of Operating.

The general design of the whole road was made by Mr. Root, who also designed and constructed the California street hill cable road. Many of the appliances and devices in use on the road were invented by Mr. Root; notably the cars, grip, tension apparatus, road-bed, depression pulley, etc. All the details were arranged under his immediate supervision, and the road is operated under license from him. The road is a first-class engineering job, and superior in its details to any heretofore built.

Considerable stress has been laid on the fact of the great weight of the cable on the Brooklyn bridge, when speaking of the difficulties to be overcome by the road. Their rope is something less than 12,000 feet long. It weighs not to exceed three-quarters the weight of the ferry cable of the Market street road, and that is only a little over one-third of the cables driven by the one engine. There is apparently no excuse in the case of the Brooklyn bridge line for hot bearings on the plea of heavy traffic, for there are probably not more than four cars at a time running; while the Market street line has forty-six cars on the road all the time, carrying heavy loads.

A NUMBER of the Bingham mines, on which work has been resumed lately, are now producing, and the prospects are favorable for their continuing to do so all winter.

SALT LAKE CITY is to have a Mining Institute, and Professor Clayton is superintending the arrangement of the rooms for the reception of minerals and furniture.

Cables and Electricity.

It is frequently suggested by the press that electricity ought to be substituted for the cable as a motive power for street cars. It is not generally understood that the electric roads are yet in the experimental stage; and, moreover, there is a misapprehension of the whole subject which should be removed. The fact is, no one has attempted to use electricity as a motive power, and no purely electric road is running. In all the experiments in that direction the object has been to utilize the electricity as a *medium* to transmit the power from a steam engine to the cars. It is a mistake commonly made by people that ought to know better, this confounding the medium with the power.

We hear frequent statements that an electric road is able to use seventy per cent of the power generated by the engine, when the fact is there is not a single road at work utilizing fifty per cent; nor a road that is running continuously from one year's end to another. These roads get their power from the heat of the coal originally, and electricity, as used for propulsion, is only a different form of the medium for transmitting the power of the engine, from that of a cable.

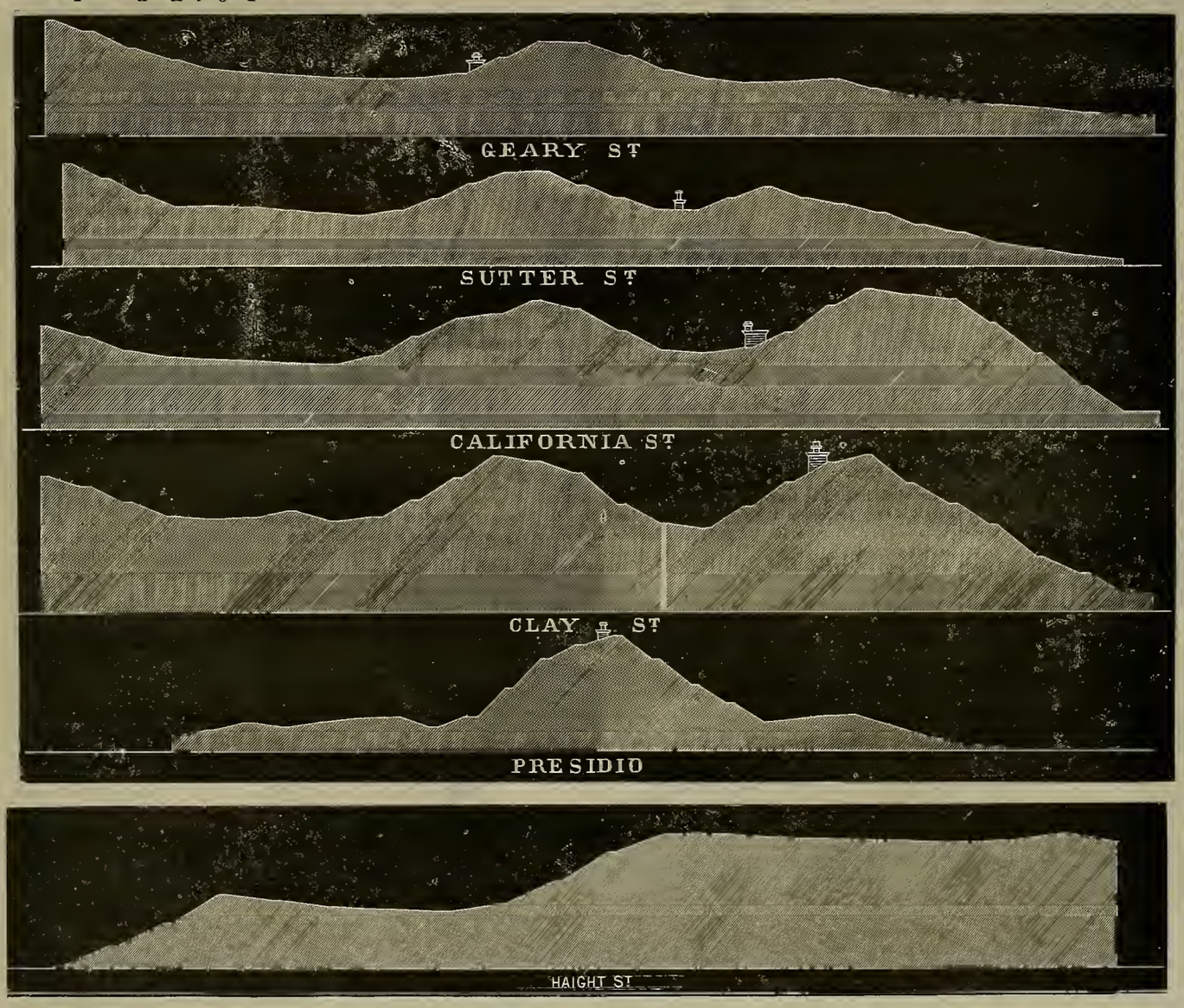
All an electric car can do, as now arranged, is to turn the wheels on the track to propel itself. One of the claims of the superiority of the electric system is the lightness of the dummy or motor. On a road in this city is a steam dummy which weighs 14,000 pounds, all on the drivers, yet it will stall with one car on a rainy day when the track is wet. An electric motor would be worse, for the power depends on the weight in such cases. Weight is required for adhesion, and with half the weight, half the adhesion is obtained. The light weight of electric dummies is really against them, instead of being an advantage.

The answer to this might be that the passengers might be put on the dummy to give it weight. That was the first idea with steam dummies, but it was found to be impracticable. The general practice is a separate dummy.

Of course, electric cars would be of no use on hills such as our roads in this city traverse; and even on what we call our level roads, they would be impracticable. The cable roads run equally well on all grades, up or down, or on a level. The weather does not affect them. The only loss of power from the main engine is the friction of the rope on the loose pulleys over which it runs.

They have been experimenting in this city with an electric motor, and so far they have found it takes a 12-horse engine five hours to charge the batteries of a dummy which will run three hours. This will never do, of course, but the experiments are being continued to increase the efficiency. Even then no hills can be climbed.

Aside from the ability to carry more passengers, the increased speed, larger size of cars, power to go up and down steep hills at the same rate, and other advantages of cable roads, they are run much cheaper than horse car lines. It is not at all probable that electricity will excel the cable system, unless some very radical improvements are made.



PROFILES OF DIFFERENT SAN FRANCISCO CABLE RAILROADS.

COEFFICIENTS OF FRICTION.—Professor Thurston states that the coefficients of friction of lubricated surfaces under pressure, as given in text books, are much too high; instead of 4 to 7 per cent, as stated therein, he has obtained as low as one-fourth of 1 per cent, with sperm oil. This, he says, is the best he ever found for heavy pressures, and he has made experiments all the way from very light up to 1,500 pounds per inch of surface. The crank pins of beam engines on steamboats, where a thousand pounds pressure to the square inch is not uncommon, run as low as one-half of 1 per cent for the friction.

F. P. BACON, President. C. L. FOUTS, Secretary.

THE GLOBE IRON WORKS CO.,

Manufacturers and Repairers of all Kinds of

MACHINERY and IRON CASTINGS

AND BUILDERS OF

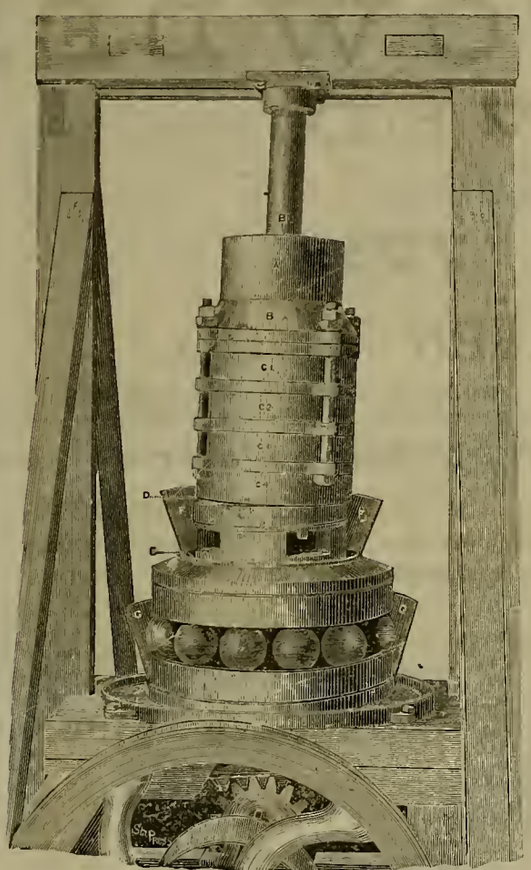
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HOISTING and MINING MACHINERY,

Portable, Stationary and Marine Engines.

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MANUFACTURERS OF THE DYER CANNON BALL QUARTZ MILL.



PATENTED OCTOBER 3, 1882.

THE

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PROPRIETORS AND MANAGERS:
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CRUSHES EQUALLY WELL, WET OR DRY, HARD QUARTZ, GRAVEL, BORAX, SOAPSTONE, BLUE CLAY, ETC., ETC.

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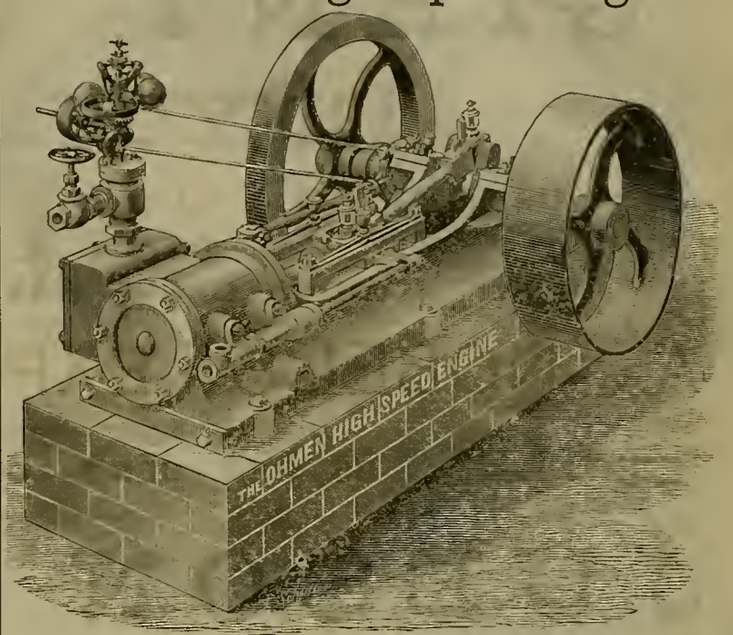
No. 1—Capacity 6 tons, weight 2,500 pounds, - - PRICE $350.
No. 2—Capacity 12 tons, weight 4,500 pounds, - - - PRICE 600.

☞Smaller and larger mills in similar proportion as to capacity, price, etc. Address

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222 and 224 Fremont St., - - San Francisco, Cal.

The Ohmen High Speed Engine.



Prize Medals Awarded to these Engines at Mechanics' Fair, San Francisco, 1881-82.

These Engines are rated in power to run from 300 to 700 feet of piston speed per minute, and are furnished in three different styles, as desired, as follows:

Class 1, Plain Slide Valve.
Class 2, Adjustable Cut-off.
Class 3, Automatic Cut-off.



In stock and constantly on hand, Engines from 4 to 100 horse power,

AT THE WORKS OF

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(DYNAMITE)

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ALL NOXIOUS CASES HAVE LATELY BEEN OVERCOME.

A. NOBEL'S EXPLOSIVE GELATINE,

The Strongest Explosive Invented, Containing

96 PER CENT. OF NITRO-GLYCERINE.

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IMPROVED!

☞ Our new Low Explosive runs as free into Boreholes as Ordinary Powder.

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Saw Mill and
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Hand-Power Elevators.

Manufacturers of B. E. Henrickson's Patent Automatic Safety Catches for Elevators. All kinds of Machinery Made and Repaired.

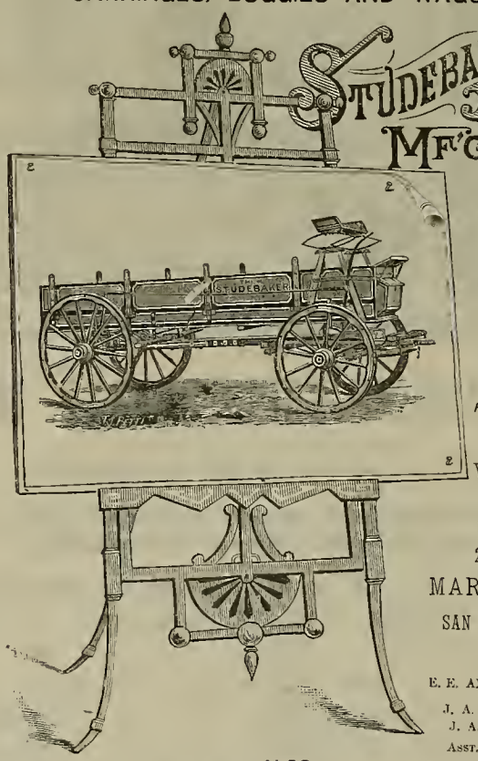
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J. A. MASSEY,
ASST. MANAGERS.

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Two Silver Medals

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MECHANICS' INSTITUTE, SAN FRANCISCO,

To Studebaker Bros. Manufacturing Company.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING, OCTOBER 16, 1883.

286,758. DEVICE FOR FASTENING PAPER BAGS—A. W. Angier, S. F.

286,674.—RIDING SADDLE—Jos. Bassler, San Jose, Cal.

286,680. ACOUSTIC TELEPHONE.—B. N. Botts, Paso Robles, Cal.

286,682. RAILWAY SWITCH—Geo. Chalmers, San Juan, Cal.

286,609. PANTALOONS—Harry Harris, Suisun, Cal.

286,842. ROASTING AND SMELTING FURNACE—E. Holman, Sandy, U. T.

286,711. LOOM—J. Laird, Jr., Forfar, Scotland.

286,714. DOOR BELL—E. Lawson, S. F.

286,733.—TWO-WHEELED VEHICLE—Jacob Price, San Leandro, Cal.

286,739. SAFETY HOOK—E. H. Smith, Rutherford, Cal.

286,861. LAYING UNDERGROUND TELEGRAPH WIRES—F. M. Speed, Walla Walla, W. T.

286,862. LAMP STOVE—J. E. Stephens, Salt Lake City, U. T.

286,649.—BREECH-LOADING ORDNANCE—J. H. Stewart, S. F.

286,742. PUMP VALVE—F. Stock, Jr., San Jose, Cal.

286,974.—HARROW—Wm. P. Triggs, East Portland, Or.

286,756.—INCUBATOR—Chas. F. Winkler, Bakersfield, Cal.

10,632 and 10,633. TRADE MARKS—Doyle & Co., S. F.

10,646. TRADE MARK—C. E. Williams & Co., Stockton.

3,589.—LABEL—Friend & Co., S. F.

3,590.—LABEL—J. C. Gamble, Garberville, Cal.

3,596.—LABEL—Newton Bros. & Co., S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific Coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

RAILWAY SWITCH.—Geo. Chalmers, San Juan, San Benito Co., Cal. No. 286,682. Dated Oct, 16, 1883. This new railway switch consists in the arrangement of levers operated by suitable deviees on the locomotive, from which, through intermediate mechanism, motion is transmitted to the switch, or throw-rails, to connect them with the side or main track, this arrangement being for the purpose of operating all the levers upon one side to keep a straight or main track, and all the levers on the other side to connect the throw-rails with the sidings. The object is to provide a switch in the operation of which the greatest simplicity exists, thereby lessening the liability of accidents, both on account of construction and the difficulty of acquiring the knowledge of its operation.

FASTENING PAPER BAGS.—Albert W. Angier, S. F. No. 286,758. Dated Oct. 16, 1883. This is a device for securing the mouth of bags when closed; and it consists in the provision of a flexible metal plate secured to the inner part of one of the sides in such position as to lie within the mouth of the bag, the said plate being so formed as to permit the upper corners of the bag to be folded laterally against it, and then to be folded over upon itself, and upon the laterally folded corners, thereby securely closing the mouth of the bag.

ACOUSTIC TELEPHONE.—B. N. Botts, Paso Robles, San Luis Obispo Co. No. 286,680. Dated Oct. 16, 1883. These improvements consist in the construction of the diaphragm of either a transmitter or a receiver, and funnel-shaped mouth piece in connection with said diaphragm, whereby it is rendered operative. The object is to perfect a simple and effective telephone.

PUMP VALVE.—Frank Stock, Jr., San Jose, Santa Clara Co. No. 286,742. Dated Oct. 16, 1883. The improvement in pump valves consists in a means for permitting and accomplishing the rotation of valve, whereby it may wear more evenly and free itself of sand and grit.

TWO-WHEELED VEHICLE.—Jacob Price, San Leandro, Cal. No. 286,733. Dated October 16, 1883. The improvements consist in a novel construction of the body of the vehicle and a means for leveling the same to suit the height of animals of different sizes which may be used.

SAFETY HOOKS.—Eward H. Smith, Rutherford, Napa Co., Cal. No. 286,739. Dated Oct. 16, 1883. This is a novel hook, which may be opened to connect or attach to any object, and afterwards closed, so as to prevent its becoming detached.

EYES brighten, cheeks become rosy, muscles gain strength by the use of Brown's Iron Bitters.

INFORMATION WANTED.—Information is wanted of Wm. Erskine, who has been living near Hailey, Alturas county, Idaho Territory, for two years past. His wife has not heard from him since last Spring. He was President of the Miners' Union of Silver City, Idaho, five or six years ago. Any news of him would be thankfully received by Mrs. Hannah Erskine, of Nevada City, Cal., or R. H. McDonald, Los Angeles, Cal.

Know

That BROWN'S IRON BITTERS will cure the worst case of dyspepsia.

Will insure a hearty appetite and increased digestion.

Cures general debility, and gives a new lease of life.

Dispels nervous depression and low spirits.

Restores an exhausted nursing mother to full strength and gives abundant sustenance for her child.

Strengthens the muscles and nerves, enriches the blood.

Overcomes weakness, wakefulness, and lack of energy

Keeps off all chills, fevers, and other malarial poison.

Will infuse with new life the weakest invalid.

37 Walker St., Baltimore, Dec. 1881.
For six years I have been a great sufferer from Blood Disease, Dyspepsia, and Constipation, and became so debilitated that I could not retain anything on my stomach, in fact, life had almost become a burden. Finally, when hope had almost left me, my husband seeing BROWN'S IRON BITTERS advertised in the paper, induced me to give it a trial. I am now taking the third bottle and have not felt so well in six years as I do at the present time.
Mrs. L. F. GRIFFIN.

BROWN'S IRON BITTERS will have a better tonic effect upon any one who needs "bracing up," than any medicine made.

ASSESSMENT NOTICE.

Seaton Gold Mining Company.—Location of principal place of business, San Francisco, California; location of works, Drytown, Amador county, Cal.

NOTICE is hereby given that at a meeting of the Board of Directors, held on the 27th day of September, 1883, an assessment (No 4) of ten cents (10c.) per share was levied upon the capital stock of this corporation, payable immediately in United States gold coin, to the Secretary at the office of the Company, Room 6, No. 528 California Street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 1st day of November, 1883, will be delinquent and advertised for sale, at public auction, and unless payment is made before, will be sold on Monday, the 19th day of November, 1883, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

A. MARTIN, Secretary.

OFFICE—Room 6, No. 528 California Street, San Francisco, California.

NOTICE TO CREDITORS.

ESTATE OF ROSEMOND GREENWOOD, deceased—Notice is hereby given by the undersigned executor and executrix of the last will and testament of Rosemond Greenwood, deceased, to the creditors of, and all persons having claims against the said deceased, to exhibit them with the necessary vouchers, within four (4) months after the first publication of this notice, to the said executor and executrix, at the office of E. W. Blaney, Esq., attorney-at-law, No. 526 Montgomery Street, the same being the place for the transaction of the business of said estate, in the City and County of San Francisco.

Dated at San Francisco, the 24 day of October, 1883.

GEORGE SPAULDING,
MARY WILLIAMS,
Executor and Executrix of the last Will and Testament of ROSEMOND GREENWOOD, deceased.

Cheap Ore Pulverizer.

There is for sale in this city, by I. A. Heald, American Machine and Model Works, 111 and 113 First St., a Rutherford Pulverizor, an improved revolving barre crusher, which was only used a few times and is as good as new. It will be sold very much below cost, and miners who are in need of such an appliance for a small mine will do well to make inquiries concerning it. It is suitable for a pulverizing mill for powder or other substances. Reference as to above can be had upon applying to this office.



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ARTIFICIAL LIMBS
ADDRESS
MENZO SPRING,
9 Geary St.
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OFFICE 5, 9 Geary St. Up-stairs.

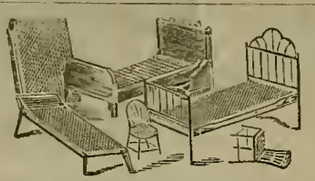
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(Of the City of San Francisco.)





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FIRST PREMIUM FOR BEST SPRING BED,
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Took FIRST PREMIUM and MEDAL as best Extension Bed, Mechanics' Fair, 1883.

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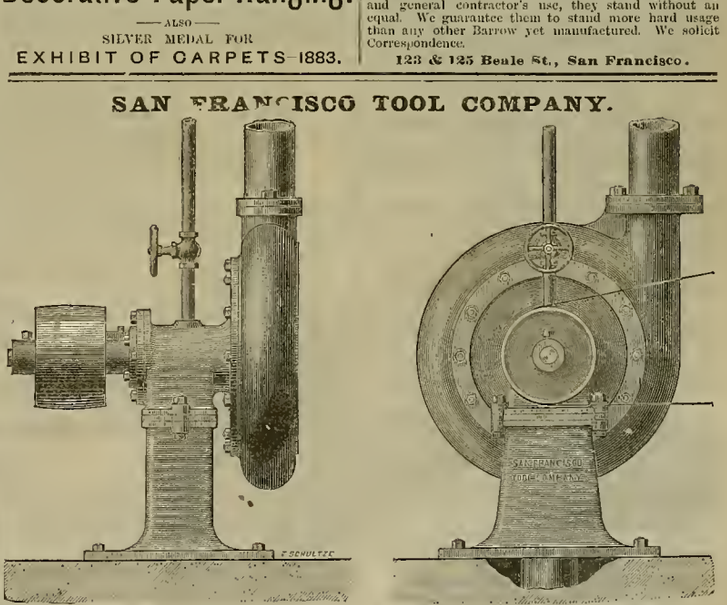
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FIRST PREMIUM SILVER MEDAL OF MECHANICS' INSTITUTE AWARDED FOR PATENT CHIMNEYS AND ORNAMENTAL CHIMNEY TOPS.
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"EUREKA," "PARAGON" and "RED CROSS"
COTTON FIRE and GARDEN HOSE.
Took First Premium and Silver Medal
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HARDIE & DARLING,
727 Market St., - - - San Francisco.
Awarded SILVER MEDAL and FIRST PREMIUM
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Decorative Paper Hanging.
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EXHIBIT OF CARPETS—1883.

WESTERN IRON WORKS,
BIGELOW, SIMS & MORRIS,
—MANUFACTURERS OF—
CHAMPION METALLIC WHEELBARROWS,
First Premium, Mechanics' Fair, 1883.
We claim this Barrow to be superior to all others manufactured on this Coast. For railroad, mining, grading and general contractor's use, they stand without an equal. We guarantee them to stand more hard usage than any other Barrow yet manufactured. We solicit Correspondence.
123 & 125 Beale St., San Francisco.

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CENTRIFUGAL PUMPS for Irrigating.
ALL SIZES. CIRCULARS SENT FREE. 11 STEVENSON ST., S. F.

SOLID VITRIFIED EMERY AND CORUNDUM WHEELS.
CAN BE RUN WET OR DRY,
In Either Water, Oil or Acid.
Send for Descriptive Circular and Price List to
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Metallurgy and Ores.

Nevada Metallurgical Works.

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ESTABLISHED, 1869, C. A. LUCKHARDT, Manager.

Ores worked by any Process.
Ores Sampled.
Assaying in all its Branches.
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Special attention paid to Examinations of Mines, plans and reports furnished.

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CHEMICAL APPARATUS AND CHEMICALS, DRUG GISTS' GLASSWARE AND SUNDRIES, Etc.

118 and 120 Market Street, and 15 and 17 California St., San Francisco.

We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc., including, also, a full stock of Chemicals.
Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit be demand for these goods both as to quality and price. Our *New Illustrated Catalogue*, with prices, will be sent on application.
☞ Our Gold and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and value tables for computation of assays in grams and grammes, will be sent free upon application. Agents for the Patent Plumbago Crucible Co., London, England.

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Assaying and Analysis of Ores, Minerals and Waters.
Mines examined and reported on.
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J. W. QUICK, MANUFACTURER.

SCREENS

Several first premiums received for Quartz Mill Screens, and Perforated Sheet Metals of every description. I would call special attention to my SLOT CUT and SLOT PUNCHED SCREENS which are attracting much attention and giving universal satisfaction. This is the only establishment on the coast devoted exclusively to the manufacture of Screens. Mill owners using Battery Screens can safely can contract for large supplies at favorable rates Orders solicited and promptly attended to.

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THE CELEBRATED A BRAND.

Shipped Direct from the New Almaden Mine,

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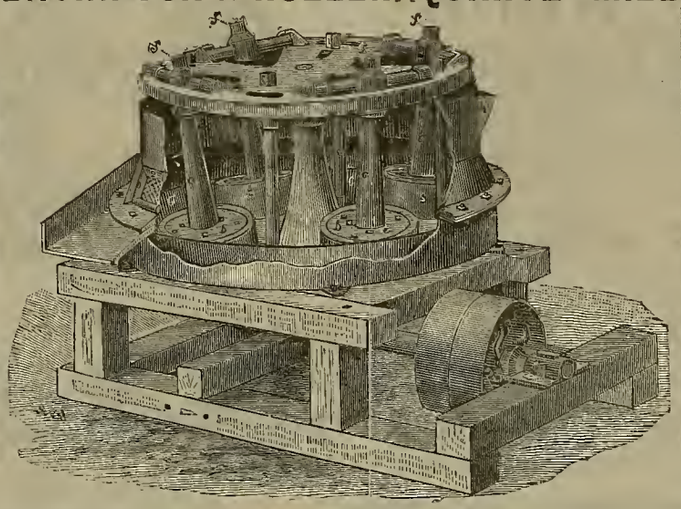
BOUND VOLUME OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce, and valuable for future reference and library use.

F. A. HUNTINGTON,

No. 45 Fremont Street, San Francisco, Cal.

CENTRIFUGAL ROLLER QUARTZ MILL!

CAPACITY AND DURABILITY GUARANTEED.



MILLS ERECTED WITH ALL APPLIANCES COMPLETE.

After running one of these mills on the Whiddon mine, in El Dorado county, over four months, and thoroughly testing its capacity and durability, I am prepared to offer it to the mining public, and claim for it the following advantages over the drop stamp mill:

1. The cost of same capacity is not more than one-half that of stamps.
2. Freight to mine one-fourth that of stamps.
3. Cost of erection at mine one-tenth that of stamps.
4. It runs with one-third the power per ton of ore crushed.
5. The wear is less than that of stamps.
6. The wearing parts are easily duplicated.
7. It has a much better discharge, and leaves the pulp in better condition for concentrating.
8. It is a better Amalgamator, saving fully nine-tenths of the gold in the mill; the balance can be saved on plates in the usual manner.
9. It is continually crushing; not like the stamp, using power to suspend it in air ninety-nine one-hundredths of the time, and the balance making a thundering noise, and accomplishing *comparatively* small results. It is as far in advance of the stamp mill as the present method of making flour with improved rolls is over the Indian's mode of crushing corn in a stone mortar.

PATTEN'S CONCENTRATOR.

This machine requires less power, less care or attention, and is less liable to get out of repair than any concentrator now in use. All of which any practical miner will comprehend when seeing it in operation.
The wear and tear is nominal, and the construction so simple that any miner can put it up and run it; and the low price brings it within the reach of all mill men, as it will save enough to pay for itself in any mill in a very short time. One machine will concentrate the tailings from a five-stamp battery.

SHINGLE MACHINES AND SAWMILL MACHINERY OF EVERY DESCRIPTION.

THE CALIFORNIA POWDER WORKS.

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HERCULES POWDER

HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in use, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fumes, notwithstanding bombastic and pretentious claims by others.

It derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.

No. 1 (XX) is the Strongest Explosive Known.
No. 2 is superior to any powder of that grade.

PATENTED IN THE UNITED STATES PATENT OFFICE.

ORDERS RECEIVED FOR HERCULES CAPS AND FUSE.

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VULCAN B B,

Black Glazed Powder,

In kegs and cases. The Best Low Grade Explosive in the market. Contains no Nitro Glycerine. Superior to Judson or any Black Powder made.

Is Unequaled for Bank Blasting & Railroad Work.

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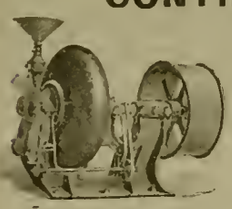
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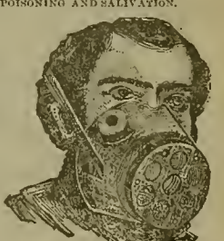


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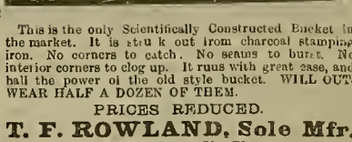
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Foundry Notes.

The Union Iron Works are busy at work on the buildings, etc., at their new premises at South San Francisco, near the Pacific Rolling Mills A shipyard and drydock will be included in the new plant. Some sixteen acres will be used. The plans, which we have examined, show that there are to be several extensive buildings, of which the boilermakers' shop will be 200 feet deep by 90 in width. In this there will be a traveling crane with a 55-foot span and a 35-foot lift. The smiths' shop will be 40 feet front by 200 deep, the pattern shop will be 50 feet front by 150 deep, and adjoining will be the supply shop, the dimensions of which will be 50x50 feet. The foundry on the right will be 90x200 feet, in which will be a traveling crane with 50 feet span and 25 lift. The core-room is 40x40 feet, and the brass foundry and coppersmiths', 40x45 feet. The machine and erecting shops each will be 40x200 feet, in which will be a traveling crane with 40 feet span and 25 lift. Next to this is the machine shop, 40x200 feet, and the erecting shops, 55x200 feet. The traveling crane here has a 55 foot span and 35 lift. Adjoining will be a machine shop 40x130 feet, and in the front of which will be situated the company's offices, occupying a space 40x70 feet. From the works will be run out two railroad tracks to a wharf on one side, and on the other to the drydock. It is intended that iron and steel vessels can be built at these shops in addition to the general foundry business now carried on. The plant will be the most extensive on the Coast.

At the Globe Iron Works they now make a specialty of another mining appliance in addition to the Dyer Cannon-Ball Crusher, being engaged in the manufacture of Andrews' new amalgamator, an appliance exhibited at the recent Mechanics' Fair.

The Judson Manufacturing Company made the first heat last week of malleable iron, the first made on the Coast. They will shortly be able to furnish this very desirable material in abundance, intending to make malleable iron-work a specialty. The business of these works is gradually increasing.

The Pacific Rolling Mills, the largest iron establishment on the Coast, is busy at its usual miscellaneous work, and employing its usual complement of men. These mills furnished over 3,000 tons of iron and steel work for the Market street cable railroad, and are now engaged on work for other cable roads.

State Mining Bureau.

Although our State Mining Bureau is suffering from lack of funds, owing to the exhaustion of the appropriation and the meagerness of its receipts from the mining stock certificate tax, it has been very successful in collecting specimens. Mr. Hanks, the State Mineralogist, has shown great energy in this direction, and has enhanced the whole collection very materially. During the past year the museum has been rearranged. The state minerals are now arranged by counties instead of by scientific classification. Yet they are all properly labeled and described. One in search of any particular kind of mineral can readily tell whereabouts it is found.

The collection is by no means, however, confined to articles from this state. The whole coast is represented. During the Triennial Conclave a special exhibit was made, and a very creditable showing was the result.

Several of the counties have provided their own cases in which to display their minerals. Inyo, Toulumne, San Bernardino, Butte, Mono, and Humboldt have their own cases. The number of visitors has greatly increased this year, and the museum has been highly praised. The State Mineralogist's annual report will shortly be ready for distribution, and will contain a large amount of valuable information concerning our mineral resources.

THE OHMEN HIGH SPEED engine, made in this city, is a favorite with those that have used it. Recent improvements in the details of the mechanism greatly increase the economy and effectiveness.

PARKE & LACY, proprietors of the mining machinery depot in this city, are constantly adding to their already heavy stock of goods, and obtaining the agency of articles of improved character.

Early History of California Mining.

In the next issue of the PRESS we will commence the publication of a series of articles descriptive of scenes and events pertaining to gold mining in California, more especially during the earlier history of the business. More than the third of a century has now elapsed since the discovery of gold at Sutter's mill, a long time in an age so distinguished for activity and enterprise. The participants in the stirring events that followed that memorable incident are fast passing away, and in a little time there will remain few or none who were eye-witnesses of the same. Meantime, a new generation has come on the stage; a generation who know little about the hardships and trials, the tumult, dangers, stampedes and excitements, and, we may add, the mistakes and follies, incident to those early days. These more recent comers know not much concerning the deprivations and perils of an overland journey or life on the plains. They have never been much in the mountains, or out on the deserts beyond, where the extremes of heat and cold and hunger and thirst are to be endured, and sometimes attacks from Indians encountered. They have heard something of these things, of the rushes and excitements, the fires and floods, the massacres and popular movements, that occurred here in times gone by, but they have no very definite idea as to extent and gravity of these occurrences, or when and where they took place.

Even the first stock of miners, those who themselves took an active part in the momentous transactions, do not now remember many interesting incidents connected therewith, and would no doubt be glad to have their memories refreshed as to these particulars. How few of this class are able to tell us what has become of very many who, for one reason or another, were conspicuous in the annals of California mining. How many are able to tell us with much fullness and accuracy the story of Sutter or Marshall, or a score of others who were intimately connected with the discovery of gold in this state? How few know whether these men are dead or alive, and if still alive, where they are and how conditioned after so many years, and so many grand opportunities enjoyed!

To answer some of those and similar questions that naturally suggest themselves in connection with this subject, will be the object of this series of papers, rather than to give a detailed description of mining as a business, which latter has been already well performed by many able writers. What we stand more in need of just now is a consecutive account of the salient points and matters of special interest connected with the early history of mining as they transpired on this Coast. Personal reminiscences, the fate and fortunes of the pioneers, the traditions of the camp, etc., more concern both the departing and the on-coming generation than a dry recital of bullion produced and progress made in mining industries. As the task of gathering up this information and putting it in shape for publication has been committed to one tolerably conversant with topics of this kind, having been here from the first, and being withal a practical writer and practical miner, we count upon its being well performed.

THE GIANT POWDER COMPANY, the oldest of the companies making high explosives, now make three grades of powder under the Nobel patents, in which it is stated that all noxious gases have lately been overcome. Great improvements have lately been made at the work of the company to meet the demands for these favorite brands of powder.

THE DOW STEAM PUMP, made in this city, has been very successful since its first introduction, and now the works have as much as they can do to manufacture enough for the demand. Some very large ones have been made. They are found to be economical and reliable pumps wherever used.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

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About Obtaining Patents.

Patents are Virtually Contracts

Between inventors and the public. The consideration flowing from both parties to the contract is expressly fixed by statute. The Government requires the following consideration in every case: First, that an applicant for a patent shall disclose a new and useful improvement, of which he is the first and original inventor. Second, that the invention has not been patented, or published in a printed publication prior to the date of his *invention*. Third, that the invention has not been in public use, or on sale, more than two years prior to his application for a patent. Fourth, that the invention shall be properly described and claimed in the specification forming a part of the patent. Provided an inventor complies strictly with these conditions, the Government guarantees that the inventor shall have the exclusive right to make, use and sell the thing invented for the term of seventeen years.

The Patent Law provides that in case a patent, which is the evidence of the contract, is not executed in compliance with the requirements of the law, it may be annulled and rendered void. Hence, it is of the greatest importance to every inventor that his patent or contract be skillfully and accurately drafted, that it may afford him complete protection for his invention during the life of his patent.

Secure a Good Patent.

An inventor should first ascertain whether or not his improvement has been patented to another. This requires an exhaustive search among all the patents in the class to which the invention relates. This question can often be answered gratuitously by us, immediately on receiving full information of the invention, by reason of our long and extensive practice as patent solicitors and editors and publishers of first-class, scientific and industrial journals, during the past 20 years and over. When the question of priority of invention is not so readily to be determined, it is generally best to make what is termed a "preliminary examination," by searching through the patent office reports among the patents in the class to which the invention relates, and referring to our extensive patent library, containing compilations of special classes of American and foreign inventions, mechanical dictionaries, scientific encyclopedias, files of scientific and mechanical newspapers, and an immense number of patent applications by inventors of this Pacific coast, carefully filed by this office since 1860.

If, by this "preliminary examination," the improvement is found to have been previously invented, our client will receive, for the small sum of $5 for the examination, a verbal or written report showing definitely whereby his invention has been anticipated, thereby saving him further expense and perhaps much time, useless delay, anxiety, etc.

To avoid all unnecessary delay, however, in securing patents at the earliest moment practicable, inventors will do well to forward a model, drawing or sketch, with a plain, full and comprehensive description of their invention (stating distinctly what the particular points of improvement are), with $15 as a first installment of fees. If the improvement appears to us to be novel and patentable, the necessary papers for an application for a patent will be prepared immediately, and forwarded to the inventor for his signature. When the inventor receives the application and finds it duly prepared, he will carefully sign and return the same plainly addressed to us, with postal money order or express receipt for our own fee. The case will then be promptly filed by us in the Patent Office, and vigorously prosecuted to secure the best patent possible. [This course is the most expeditious and satisfactory, as no time is lost in transmitting correspondence relative to the preliminary steps to be taken.] When the patent is allowed the inventor will be duly notified, and on sending the final Government fee of $20 to us, we will order the issue of the patent, and forward the same as soon as it is secured from the Patent Office.

The payments are thus divided and made easy. We make no pretence of doing cheap work, in order to entice custom, nor do we afterward make additional charges to bring the bill up to a fair compensation. We do our work honestly and thoroughly, and we never give a case up as long as there is a chance to obtain a patent. The Agency charge is from $25 to $30, or sometimes more, if the invention is intricate or complicated, or requires much labor. Drawings cost from $5 upward, according to their number and the time employed, and, if a model is sent, the express charges upon this and the papers must be added. The total cost, in addition to Government fees, rarely exceeds $40, and for this we do all we can without appealing the case.

When the invention consists of a new article of manufacture, or a new composition, samples of the separate ingredients sufficient to make the experiment and also of the manufactured article itself, must be furnished.

Models and Drawings.

Models are now seldom required by the Commissioner of Patents, and generally only in intricate cases. Perfect drawings of practical working machines are considered more satisfactory to the Patent Office than the old and more cumbersome system of storing up an immense bulk of almost numberless models.

Drawings or sketches, sufficient to illustrate clearly the invention, with a sufficient description to enable us to make a full set of perfect drawings for the Patent Office is all that we require. A model will answer our purpose as well; however, in cases where the inventor can more easily furnish it for our use.

The value and even the validity of a patent often depends on the character, clearness and sufficiency of its drawings There are thousands of existing patents in which the improvements are but partially or very poorly illustrated in the drawings. When an attempt is made to dispose of such patents, the vagueness and defects of the drawings often prejudice capitalists and manufacturers against the invention, while in reality it may be of great value, and would meet with ready sale had the invention been fully portrayed by artistic and skillfully executed drawings. Again, when patents of this character are brought into court, the uncertainty and ambiguity of the drawings enable the opposing experts to mystify the judges as to the construction or combination of parts intended to be covered by the patentee. In all cases prepared by us, the drawings are made under our personal supervision, by skilled draftsmen in our constant employ, and every precaution is taken that the invention is fully and clearly shown by different views, so that the improvement will be readily understood by the Examiners in the Patent Office, and comprehended by the public when the patent is granted.

In the Patent Office

The application is assigned to the Examiner having charge of the class to which the invention relates. The case must then take its turn with others in the order of filing, and in due time is carefully examined to test the novelty of the invention. If the examiner fails to find anything that anticipates the invention, a patent is immediately allowed, provided the specification and claims are drafted in proper form. Should the Examiner find a prior patent which, in his opinion, anticipates one or more of the claims in the application, a letter or rejection is sent to the attorney in charge of the case; and, if the attorney coincides with the views of the Examiner, the claims rejected are erased. In preparing applications for patents, an attorney should be careful to familiarize himself with the class of inventions to which the application pertains, so that the specification and claims may be drafted as nearly perfect in the first instance as is possible. This course saves much time in prosecuting the application to a patent.

When claims are improperly rejected on patents which do not anticipate the spirit or wording of the claims, proper steps are immediately taken to convince the Examiner of his error. This is done, in most part, by personal arguments, as the differences in construction, operation, function and results are more readily discovered and appreciated by an oral presentation of the facts than can possibly be done by relying solely on written arguments. In order that the Patent Office record of the patents shall be complete, an oral argument is generally supplemented by a manuscript brief, that others, in examining the files at any future time, may clearly comprehend the points as taken by the Examiner and attorney in prosecuting the case to patent.

In addition to our own personal attention to the interests of our clients here, we have, for over 12 years past, had constantly in association with us in Washington, one of the ablest legal counselors and ablest of practitioners in patent business in this country, who carefully attends in person to our business at the Patent Office, and has attained success in a most marked degree.

Perfect Claims.

The value and force of a patent are dependent on its claims. A patent may disclose to the public the most important and valuable invention, and yet the claim be of such meager scope that the patent is actually worthless. When the claims of a patent are so loosely drafted that infringers can flood the market with improvements, differing from the improvement disclosed by the patent only in slight changes in construction and arrangements of parts, such a patent is valueless to the owner, as it fails to afford him that exclusive and complete protection guaranteed by the Patent Laws. Hence it is that the greatest care, skill and perseverance are required, first, in properly drafting the claims in the first instance, and second, in prosecuting the application before the Patent Office, and maintaining the rights of the inventor to claims as broad and sweeping as the invention will warrant. This latter is no easy task. The Examiners of the Patent Office serve in the capacity of attorneys guarding the interests of the public. It is their sworn duty to exercise the greatest care and watchfulness, that patentees do not secure claims of greater scope than they are justly entitled to. It is but natural that Examiners are sometimes in error as to just what scope should be accredited an invention. Although the Examiners act under honest convictions in cases where they refuse an inventor his just rights, yet it is the duty of the attorney to maintain the claims of his client, if he is convinced that they are just and proper. To succeed in this requires the display of tact firmness and ability; and when the Examiner is made to see that the inventor is honestly and fairly entitled to the claims which have been rejected, he will almost invariably recede from his former action, and allow the case.

Advantages to Inventors on the Pacific Coast.

The firm of DEWEY & Co. (continuously editors and publishers of the MINING AND SCIENTIFIC PRESS, nearly from its early commencement in 1860) offer comparatively far better facilities to the local inventors of the Pacific States and Territories than are possessed by any other agents in America. Members of the firm give personal attention to the applications entrusted to their care. They have been longer in practice in patent soliciting than most agents who are still personally engaged in the business. They have secured more U. S. and foreign patents in the past 20 years (with very few exceptions) than any firm still existing. Their practice has been so successful and long continued, that the great majority of inventions on this side of the American continent have been patented through their agency, thus affording them great and valuable experience, by those the information of the true principles and points of novelty in the inventions, whether general in character or peculiarly local to this coast.

The extensive business combination and experience of this firm, is undoubtedly one of the most fortunate in existence for affording inventors prompt and reliable advice, and the best possible facilities for securing their full patent rights with safety and dispatch at uniformly reasonable rates.

Every patentee of a worthy invention is guaranteed the gratuitous publication of a clearly-stated and correct description of his invention, in one or more of our influential and reliable newspapers, affording just the circulation that is best calculated to widely inform the class of readers most especially interested in the subject of his invention.

Saving of Time Etc.

Inventors on this coast will find that owing to our familiarity with inventions and local affairs of this coast, we can more readily and fully comprehend their wants, and thus save much of the time ordinarily consumed in preliminary writing back and forth when distant agencies are employed.

Caveats.

A Caveat is a confidential communication made to the Patent Office, and is therefore filed within its secret archives. The privilege secured under a caveat is, that it entitles the caveator to receive notice, for a period of one year, of any application for a patent subsequently filed, and which is adjudged to be novel, and is likely to interfere with the invention described in the caveat; and the caveator is then required to complete his application for a patent within three months from the date of said notice. Caveat papers should be very carefully prepared. Our fee for the service varies from $10 to $20. The Government fee is $10 additional.

To enable us to prepare caveat papers, we only require sketch and description of the invention.

Rejected Applications.

Inventors who have rejected cases (prepared either by themselves, or for them by other agents), who desire to ascertain their prospects of success by further efforts, are invited to avail themselves of our unrivaled facilities for securing favorable results. We have been successful in securing Letters Patent in many previously abandoned cases. Our terms are always reasonable.

Inventors who do business with us will be notified of the state of their application in the Patent Office, when it is possible for us to do so.

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San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, Oct. 25, 1883.

ANTIMONY—Per pound	14	@	15
IRON—American Pig, soft, ton	30	00	@ —
Scotch Pig, ton	26	00	@27 50
American White Pig, ton	—	@	—
Oregon Pig, ton	—	@	—
Clipper Gap, Nos. 1 to 4	32	50	@35 00
Refined Bar	4	@	—
Horseshoe, Keg	5	50	@ —
Nail Rod	7½	@	—
Norway, according to thickness	6½	@	7
STEEL—English Cast, lb	16	@	25
Black Diamond, ordinary sizes	14	@	—
Drill	15	@	16
Machinery	12	@	14
COPPER—Ingot	22	@	—
Sheet	31	@	35
Sheeting, lined, 14x18	22	@	23
Nails	17	@	—
Bolts	34	@	—
Old	8	@	—
Bar	—	@	—
Cement, 100 fine	15½	@	—
LEAD—Pig	4½	@	4
Bar	6	@	—
Pipe	7	@	—
Sheet	8	@	—
Shot, discount 10% on 500 bags: Drop, ₱ bag	2	10	@ —
Buck, ₱ bag	2	30	@ —
Chilled, do	2	50	@ —
TIN PLATES—Charcoal	7	55	@ —
Coke	5	50	@ 5 75
Banca Tin	25	00	@ —
Australian	25	00	@ —
I. C. Charcoal Roofing, 14x20	6	50	@ 6 80
ZINC—By the cask	10	@	—
Sheet, 7x3 ft, 7 to 10 lb. less the cask	90	@	—
NAILS—Assorted sizes	3	30	@ 4 75
QUICKSILVER—By the flask	34½	@	—
Flasks, new	1	05	@ —
Flasks, old		85	@ —

A Worthy Journal.

It is probably not necessary to call the attention of our readers to the character of the contents of the PRESS of late, nevertheless it is a satisfaction to do so. We have been giving a large amount of original correspondence recently, from our traveling and local correspondents, and our engravings of mining machinery and appliances have been new and very valuable to our readers. Within the past few months we have given a great many engravings and descriptions of appliances of the highest interest to the miner and metallurgist. The articles in this week's PRESS, with full illustrations, are of great scientific and practical value, and no doubt will be appreciated by all.

It is our aim to obtain from every possible source all reliable information on such topics as will interest the miner, metallurgist and mechanic. In fact, the MINING AND SCIENTIFIC PRESS is the only mining paper published which makes a specialty of illustrating and describing the details of mechanical appliances of mining. Bound volumes of the PRESS are of a far more practical value than most books, inasmuch as so wide a range is covered, and all the latest appliances described.

In addition to these things, all the current mining news is given, and a record of scientific and mechanical progress each week. It is gratifying to us to know that these efforts of the publishers are appreciated by the readers. The impartial judgment of any intelligent man will lead him to appreciate the PRESS, should he but glance over the columns of a few numbers. The assistance of old subscribers is of great advantage to the paper, and we shall be very glad to have it whenever opportunity offers.

THE seized goods of Donohoe, the San Francisco banker, will be released upon the payment of the duties, amounting to $1,628, and the further payment of costs and expenses, not yet figured up.

Scientific and Technical Associations.

The following are the more important scientific and technical associations in San Francisco.

California Academy of Sciences.

Meets 1st and 3d Mondays of each month at 7:30 P. M., at Academy's building, southwest corner California and Dupont streets. Rooms open daily from 9 to 4. Visitors free. Crocker-Stanford natural history collection in Mercantile Library Hall, No. 214 Bush street. President, Professor George Davidson, U. S. Coast and Geodetic Survey, Appraiser's building, Sansome and Jackson. Secretary, Charles G. Yale, editorial rooms MINING AND SCIENTIFIC PRESS, 111 Clay. W. G. W. Harford, Director of Museum, in Academy's building.

Mechanics' Institute.

Rooms and Library 31 Post street. Library contains 33,000 volumes. P. B. Cornwall, President, 609 Harrison street. Horace Wilson, Librarian.

Geographical Society of the Pacific.

No. 414 Post street. Meets 2d and 4th Mondays of month. Professor George Davidson, President, Appraiser's building, corner Sansome and Jackson. C. Mitchell Grant, Secretary, at Society's rooms.

California Pharmaceutical Society and College of Pharmacy.

Fulton street, between Polk and Van Ness avenue. Quarterly meetings. Emlen Painter, President, 511 Seventh street. Fred Grazer, Secretary, 1114 Howard.

Miners' Association.

No. 320 Sansome. Hamilton Smith, Jr., President. Walter A. Skidmore, Secretary.

California State Geological Society.

Rooms at State Mining Bureau, 212 Sutter street. Meetings 1st and 3d Tuesdays of Month. H. G. Hanks, President, 212 Sutter street. S. Heydenfeldt, Jr., Secretary, No. 309 Montgomery.

California State Mining Bureau.

No. 212 Sutter street, near Kearny. Free admission to museum from 10 to 3. Henry G. Hanks, State Mineralogist.

San Francisco Microscopical Society.

Rooms 120 Sutter street. Meets at 8 P. M. on 2d and 4th Mondays of the month. President, C. Mason Kinne, 122 California street. Secretary, E. J. Wickson, editorial rooms MINING AND SCIENTIFIC PRESS, 414 Clay.

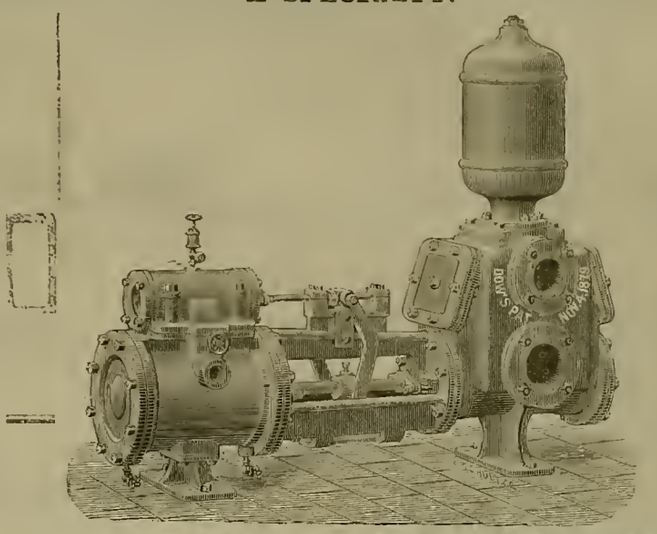
IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

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THICKNESS.		Double Riveting. PRESSURE.	Single Riveting PRESSURE.
1/16 inch....	.0625	12.499	10.416
1/8 "	.125	24.999	20.833
3/16 "	.1875	37.498	31.249
1/4 "	.25	49.999	41.666
	.26	51.999	43.333
5/16 "	.3125	62.499	52.083
3/8 "	.375	74.998	62.499
7/16 "	.4375	87.499	72.916
1/2 "	.5	99.999	83.333
9/16 "	.5625	112.498	93.749
5/8 "	.625	124.999	104.166
11/16 "	.6875	137.498	114.582
3/4 "	.75	149.998	124.999
13/16 "	.8125	162.499	135.416

To find the pressure for any diameter preferred, divide the "pressure," in column opposite the thickness of iron selected, by the diameter, and the quotient will be the pounds pressure allowable by U. S. Law, the right-hand figure being a decimal in all cases. Deduct 10 per cent. for iron stamped 45000, or add 10 per cent. for iron stamped 55000.

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Extra inducements will be offered for a few active canvassers who will give their whole attention (for a while at least) to soliciting subscriptions and advertisements for this journal and our other first-class popular newspapers. Apply soon, or address this office, giving address, age, experience and reference.

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COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $4 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turning a leaf.

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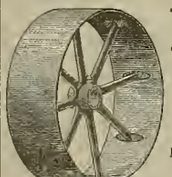
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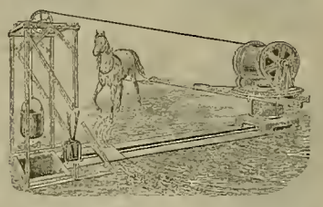
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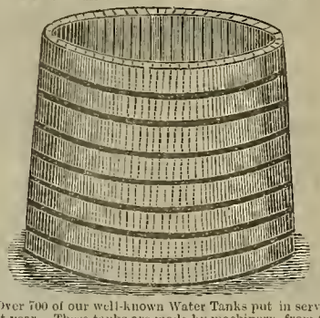

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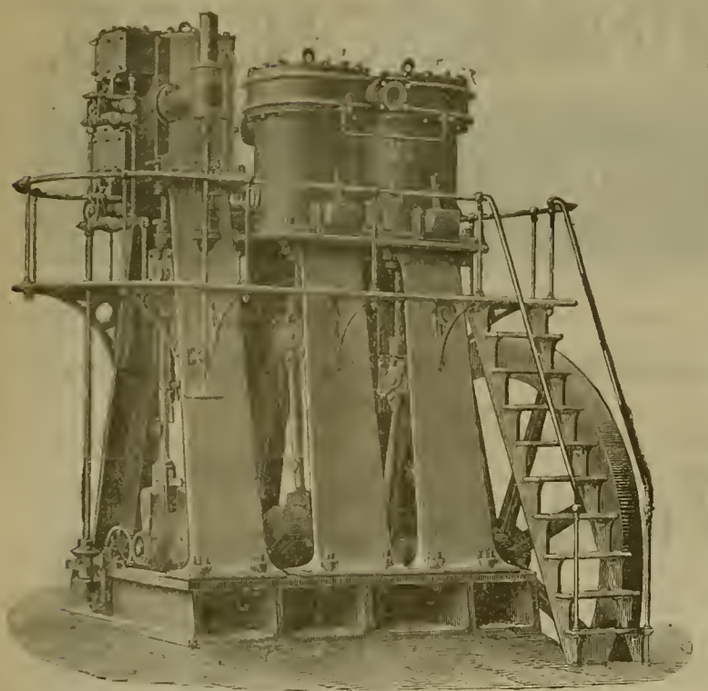
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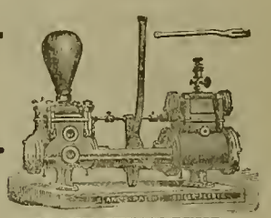


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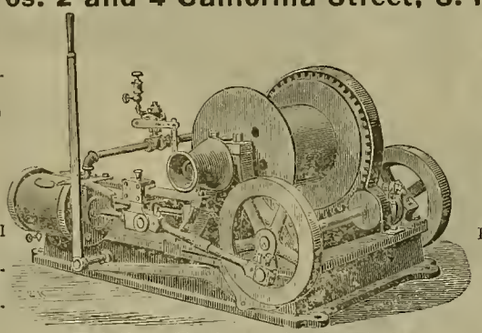


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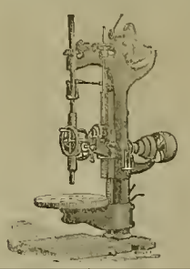




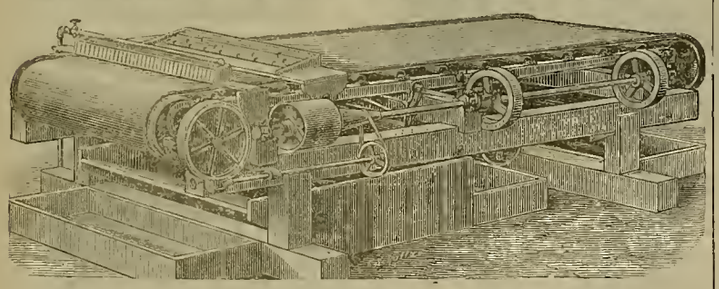
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That legal advice has been given that *all shaking motion* applied to an *endless traveling* belt used for concentration of ores is an infringement on patents held and owned by the Frue Vanning Machine Company

That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.

That the patent laws make *users* of infringements responsible as well as makers, and the public is therefore warned that there is considerable risk in purchasing any end-shake machine until our various patents have been decided.

That if there are those who for any reason prefer an end-shake machine, we can manufacture and sell to such machine of that description, as efficient as the Triumph, and at a lower price, and no liability for infringement will then be incurred by the purchaser.

That we shall protect ourselves against any one making, selling or using any machine infringing any of our patents. Patented July 9, 1867; May 4, 1869; Dec. 22, 1874; Sept. 2, 1879; April 27, 1880. Patents applied for.

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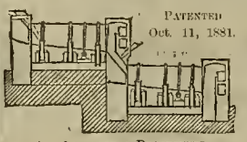
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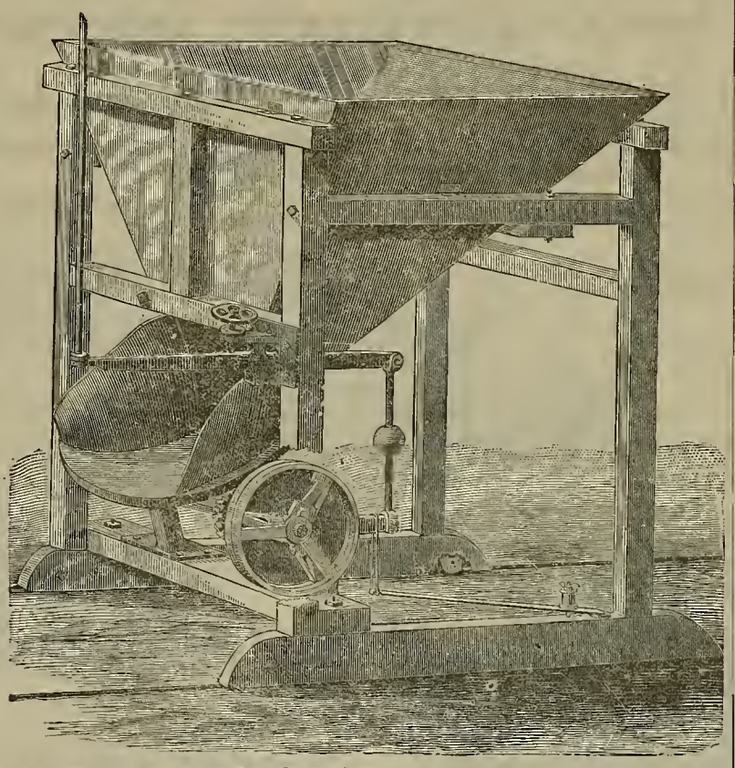
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Zeile	40	"	" " "
Pacific	40	"	" " "
Nashville	20	"	El Dorado " "
Grose	80	"	" " "
Julian	20	"	Placer " "
St. Patrick	15	"	" " "
Providence	40	"	Nevada " "
Empire	20	"	" " "
Idaho	30	"	" " "
Green Mountain	60	"	Plumas " "
Plumas-Eureka	90	"	" " "
Bulwer-Standard	30	"	Bodie, Mono, "
Standard	20	"	" " "
Noonday	30	"	" " "
Big Dry Creek	10	"	Fresno " "
Mexican	44	"	Lyon county, Nevada.
Santiago	32	"	" " "
Vivian	16	"	" " "
Christy	5	"	Uintah, county, Utah.
Contention	20	"	Tombstone, Arizona.
Grand Central	20	"	" "
Sunshine	20	"	Black Hills, Dakota.
Homestake	200	"	" " "
Father de Smet	80	"	" " "
Hidden Treasure	40	"	" " "
Highland	120	"	" " "

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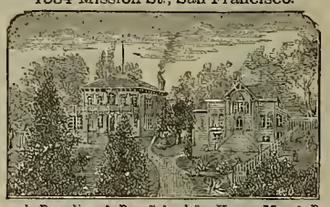
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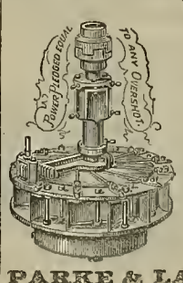
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BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, NOVEMBER 3, 1883.

VOLUME XLVII
Number 18.

The Manufacture of Charcoal in Kilns.

The manufacture of charcoal in kilns was declared many years ago, after a series of experiments made in poorly constructed furnaces, to be unprofitable, and the subject is dismissed by most writers with the remark, that in order to use the method economically the products of distillation, both liquid and gaseous, must be collected. T. Egleston, Ph. D., of the School of Mines, New York, has read a paper on the subject before the American Institute of Mining Engineers, from which we extract as follows: As there are many

Silver Districts in the West

Where coke can not be had at such a price as will allow of its being used, and where the ores are of such a nature that wood can not be used in a reverberatory furnace, the most economical method of making charcoal is an important question.

Kilns for the manufacture of charcoal are made of almost any shape and size, determined in most cases by the fancy of the builder, or by the necessities of the shape of the ground selected. They do not differ from each other in any principle of manufacture, nor does there seem to be any appreciable difference in the quality of the fuel they produce, when the process is conducted with equal care in the different varieties; but there is a considerable difference in the yield and in the cost of the process in favor of small over large kilns. The different varieties have come into and gone out of use mainly on account of the cost of construction and of repairs. The object of a kiln is to replace the cover of a meiler by a permanent structure. Intermediate between the meiler and the kiln is the Foucauld system, the object of which is to replace the cover by a structure more or less permanent, which has all the disadvantages of both systems, with no advantages peculiar to itself.

The kilns which are used may be divided into the rectangular, the round, and the conical, but the first two seem to be disappearing before the last, which is as readily built and much more easily managed.

All Varieties of Kilns

Are usually built of red brick, or, rarely, of brick and stone together. Occasionally, refractory brick is used, but it is not necessary. The foundations are usually made of stone. There are several precautions necessary in constructing the walls. The brick should be sufficiently hard to resist the fire, and should therefore be tested before using. It is an unnecessary expense to use either second or third quality fire-brick. As the pyroligneous acid which results from the distillation of the wood attacks lime mortar, it is best to lay up the brick with fire-clay mortar, to which a little salt has been added; sometimes loam mixed with coal-tar, to which a little salt is also added, is used. As the principal office of this mortar is to fill the joints, special care must be taken in laying the bricks that every joint is broken, and frequent headers put in to tie the bricks together. It is especially necessary that all the joints should be carefully filled, as any small open spaces would admit air, and would materially decrease the yield of the kiln. The floor of the kiln was formerly made of two rows of brick set edgewise and carefully laid, but latterly it is found to be best made of clay. Any material, however, that will pack hard may be used. It must be well beaten down with paving mauls. The center must be about six inches higher than the sides, which are brought up to the bottom of the lower vents. Most kilns are carefully pointed, and are then painted on the outside with a wash of clay suspended in water, and covered with a coating of coal-tar, which makes them waterproof, and does not require to be renewed for several years.

The kilns were formerly roofed over with rough boards to protect the masonry from the weather, but as no special advantage was found to result from so doing, since of late years they have been made water-proof, the practice has been discontinued.

The wood used is cut about one and a fifth meters long. The diameter is not considered of much importance, except in so far as it is desirable to have it as nearly uniform as possible. When most of the wood is small, and only a small part of it is large, the large pieces are usually split, to make it pack well. It has been found most satisfactory to have three rows of vents around the kiln, which should be provided with a cast-iron frame reaching to the inside of the furnace. The vents near the ground are generally five inches high—the size of two bricks—and four inches wide—the width of one—and the holes are closed by inserting one or two bricks in them. They are usually the size of one brick, and larger on the outside than on the inside. These holes are usually from .45m. to .60m. apart vertically, and from .80m. to .90m. apart horizontally. The lower vents start on the second row of the brickwork above the foundation, and are placed on the level with the floor, so that the fire can draw to the bottom. There is sometimes an additional opening near the top to allow of the rapid escape of the smoke and gas at the time of firing, which is then closed, and kept closed, until the kiln is discharged. This applies mostly to the best types of conical kilns. In the circular and conical ones the top charging-door is some times used for this purpose. Hard and soft woods are burned indifferently in the kilns.

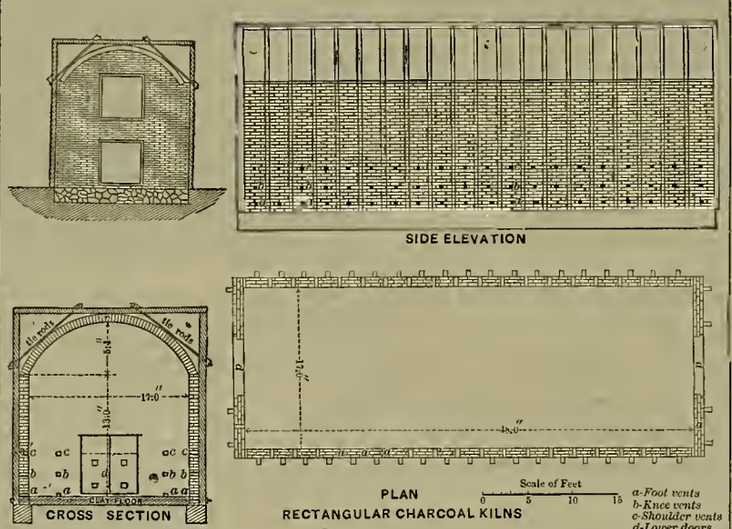


Fig. 1.

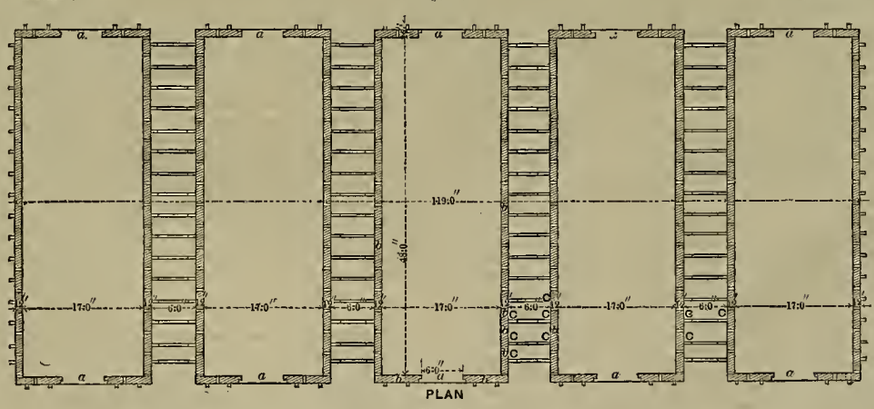


Fig. 2.

RECTANGULAR KILNS FOR THE MANUFACTURE OF CHARCOAL.

Hard-wood coal weighs more than soft, and the hard variety of charcoal is usually preferred for blast furnaces, and for such purposes there is an advantage of fully 33⅓ per cent, or even more, in using hard woods. For the direct process in the bloomaries, soft-wood charcoal is preferred. It is found that it is not usually advantageous to build kilns of over 160 to 180 cubic meters in capacity. Larger furnaces have been used, and give as good a yield, but they are much more cumbersome to manage. The largest yield got from kilns is from 50 to 60 bushels for hard wood to 50 for soft wood. The average yield, however, is about 45 bushels. In meilers, two and a half to three cords of wood are required for 100 bushels, or 30 to 40 bushels to the cord. The kiln charcoal is very large, so that the loss in fine coal is very much diminished. The pieces usually come out the whole size, and some times the whole length of the wood.

The rectangular kilns were those which were formerly exclusively in use. They are generally built to contain from 30 to 90 cords of wood. The usual sizes are given in the table below:

	1	2	3	4
Length	50	40	40	48
Width	12	15	14	17
Height	12	15	18	18
Capacity, in cords	55	70	75	90

1 and 2. Used in New England. 3. Type of those used in Mexico. 4. Kiln at Lauton, Mich.

The arch is usually an arc of a circle A kiln of the size of No. 4, as constructed at the Michigan Central Iron Works, with a good burn, will yield 4,000 bushels of charcoal.

The vertical walls in the best constructions are 12 to 13 feet high, and 1½ brick thick, containing from 20 to 22 bricks to the cubic foot of wall. To insure sufficient strength to resist the expansion and contraction due to the heating and cooling, they should be provided with buttresses which are 1 brick thick and 2 wide, as at Wassaic, New York; but many of them are built without them, as at Lauton, Michigan, as shown in the engraving. In both cases they are supported with strong braces, from 3 to 4 feet apart, made of round or hewn wood, or of cast iron, which are buried in the ground below, and are tied above and below with iron rods, as in the engraving, and the lower end passing beneath the floor of the kiln. When made of wood they are usually 8 inches square, or round, or sometimes by 8 inches, placed edgewise. They are sometimes tied at the top with wooden braces of the same size, which are securely fastened by iron rods running through the corners, as shown. When a number of kilns are built together, as at the Michigan Central Iron Works, at Lauton, Michigan, shown in the plan view, only the end kilns are braced in this way. The intermediate ones are supported below by wooden braces, securely fastened at the bottom. The roof is always arched, is one brick, or eight inches thick, and is laid in headers, fourteen being used in each superficial foot. Many of the kilns have in the center a round hole, from sixteen to eighteen inches in diameter, which is closed by a cast-iron plate. It requires from 35 M. to 40 M. brick for a kiln of 45 cords, and 60 M. to 65 M. for one of 90 cords.

A MANUFACTORY of vegetable oils, starch and bluing is being erected in Los Angeles.

Shoshone County, Idaho.

The statement made in some of the papers that the recently discovered rich placer district in the Cœur d'Alene Mountains is situated in Shoshone County, Idaho, recalls some passages in the history of this, the oldest county in the territory, and some of its more salient physical features. Shoshone County was an organized county in Washington Territory before Idaho had being as a distinct political community, and was represented in the Legislature of Washington Territory during the years 1861 and 1862. Early in 1863 the Territory of Idaho was organized, with the capital at Lewiston, and here the first and second sessions of the Idaho Legislature were held. The first permanent occupation by white people of the region now covered by Shoshone County was in the autumn of 1860, when what was then known as the Oro Fino placer gold mines were discovered. The fame of these "diggings" soon spread far and wide, and thousands from the older placer fields of California and Oregon congregated in the new El Dorado. The county embraced at the beginning nearly the entire region watered by the numerous tributaries of the north and south branches of the Clearwater. A portion of the county lies north and east of this water-shed, taking in a portion of the Cœur d'Alene range of mountains, and some of the country drained by the tributaries of the Cœur d'Alene River. It is in this range of mountains that the new placer district has been discovered, though we have not yet been able to verify the fact that the new mines are located within the boundary of Shoshone County. The surface of the entire region of which we write is high, and for the most part rugged and mountainous, with numerous streams of every size, below that of the main river, penetrating the mountains, through channels that for long sections of their course have so little fall that much difficulty was experienced in many cases in getting the water to flow with sufficient rapidity to wash the gold from the earth and gravel by the first rude processes applied hy the miners. All the river and creek bottoms and the flanks of the mountains are covered by a dense growth of the finest pine, fir, cedar, hemlock and spruce timber. The lumber interests alone in that old county, when fully developed, will constitute a source of great wealth. On the plateaus near the south branch of the Clearwater there are extensive bodies of fine agricultural and grazing lands, which have recently been surveyed, and which are being rapidly appropriated by settlers.

The mines on the Oro Fino Creek and its tributaries have been continuously worked since 1860, and though the long series of successive excitements and the constantly decreasing output have continued to diminish the population from year to year, the good old county has continued to hold its head up bravely under all adverse circumstances, keeping up its county organization, maintaining its financial credit, and keeping its representation in the Legislature, the comparatively few people remaining there showing a wonderful faith in the old camp, and a determination to stay with it to the last. One peculiarity of this old placer region is, that though numerous rich and extensive placers have been found and worked, and though the entire region has been exhaustively prospected for gold-bearing quartz lodes, very few of these have been found, and fewer still that have been made to pay the cost of working. But there have been great excitements from time to time caused by rumors of rich quartz discoveries. What will long he remembered as the Robinson ledge, and which has long since been classed among the exploded humbugs and myths with which prospectors have often deluded themselves and others, was mentally located at different times in many different parts of the county, where it was persistently but vainly searched for hy eager prospectors. Now, we don't yet know that the new placers are within the boundaries of the old county, but it would be poetic justice for them to be found there, and we hope that the event will prove it to be so. And since the gold found in the district is of the character known as coarse gold, with indications of not having been washed down from a great distance, future labors of the prospector may reveal the existence of rich quartz lodes, and who knows that the Robinson ledge itself may not yet he found. It is a remarkable fact that in auriferous mountain regions, particularly where the country is covered with dense forest, no matter how long the country has been occupied or how thoroughly it may have been explored and prospected, new and rich discoveries are always possible, and continue to be made. The discovery of these rich placers, in whatever county they may be located, will give a fresh impetus to prospecting, and will be certain to bring to light other placers long hidden in the recesses of the Cœur d'Alene and Bitter Root Mountains. These discoveries and the almost certain prospect that the Northern Pacific will push a branch through some pass in the Bitter Root Mountains and down the Clearwater to Lewiston, give a most cheering outlook for old Shoshone, which will cause the recreant old tramps who left her so long ago to fight her own battles wish they had remained to share her good fortune.

THE Los Angeles and San Gabriel railroad has secured the right of way for nearly the whole distance of the projected line, some twenty-eight miles. Active operations will probably be commenced in about six weeks.

The Ontario Resumes Dividends.

The Ontario Mining Company has resumed dividends. The mine is in Utah, and the office of the incorporation is in New York, where on the 15th instant a dividend of 50c per share for September was declared, payable on the 31st instant. This dividend is numbered 88 in the official notice. At the time of the suspension of dividends last February, our record showed 86 dividends paid, amounting to $4,900,000. The dividend declared on the 15th amounts to $75,000, which, when paid, the New York *Journal of Commerce* says, will swell the total to an even $5,000,000. Our record shows 87 dividends, of $4,975,000. Where the other dividend of $25,000 came in we are unable to tell. Since the suspension of dividends last February, important and expensive improvements have been made at the mine. It was found necessary to reduce the expense of handling the water, and so a drain tunnel was ordered to he constructed, tapping the mine at the 600-foot level at shaft No. 3. The tunnel is 5,763 feet long and 5 hy 7 in the clear, exclusive of lumber flume on the floor 18 inches deep by 3 feet wide, through which water 9 inches deep is running like a mill race. This tunnel cost from $25 to $30 per foot, and it is estimated that it will effect a saving of $100,000 per year in the handling of the water from the mine. This is the most important enterprise ever undertaken by a single silver metal bearing mine. It it now believed that the water question is under control for the next two or three years. Of course these outlays of money and labor would not have been undertaken if there had not been a reasonable prospect that the situation warranted the same. The Ontario has always been regarded as one of the best managed silver mines in the country. Haggin and Tevis of this city have been large owners from the commencement. The output of the mine above the 600 foot level has been about $14,000,000. It is estimated that there is enough ore between the 600 and 800 foot levels to keep the present milling capacity employed for two or three years. Shaft No. 3 will be sunk to a depth of 1,000 feet. The company has purchased a large area of adjoining ground, much of which is known to contain metal-bearing rock. There is therefore a long lease of active usefulness for the Ontario mine in prospect.—*Bulletin.*

Opinions About the Cable Cars.

The cable car system of street railways, now in use in Chicago, has lately received a good deal of commendatory notice from parties who ought to know what they are talking about, and whose opinions ought to be entitled to weight. The correspondent of the London *Times*, who accompanied the Villard party on the famous "last spike" driving expedition, mentioned the system in a letter to the great English journal as one which possessed many important advantages, and the Chicago cable cars are models of elegance, convenience and safety.

This was no undeserved compliment to the cable cars, which are as a matter of fact what the *Times* correspondent described them to be; and the prejudice which for a while existed in the minds of many Chicagoans against the cable system has gradually yielded to the logic of events. This method of passenger transportation could not now be dispensed with, and the underground cable, which has been thoroughly tried, found to he reliable under all circumstances, and which requires for its operation no unsightly structures on the public thoroughfares, is not likely to be superseded by the concentrated lightning motor, or any elevated railway project. The Congress of Street Railwaymen, which was in session at the Grand Pacific Hotel last week, appeared to be almost unanimously of the opinion that the cable system was the only one that would prove a successful competitor of the old conservative mule power in propelling street cars, and Superintendent Holmes's historical report of the inauguration and satisfactory working of his twenty-odd miles of line was listened to with marked attention. The enterprise met with a considerable, but not very intelligent, opposition in its inception and infancy, but its intrinsic merits were at last appreciated, and gained for it substantial public favor. The cable cars, by the by, are the only ones in use on any of the city roads, so far as the writer is informed, which are so constructed that a passenger stumbling in getting on or off could not fall beneath the wheels.—*Chicago Inter-Ocean.*

MINING COMPANY ENJOINED.—On Monday last, in the Superior Court of Sutter County, Judge Keyser rendered a decision in the debris suit of Allen S. Noyes against the Spring Valley Hydraulic Mining Company, granting the perpetual injunction prayed for. The company's mine is at Cherokee, Butte County, and one of the largest in the state. Noyes owns land in Butte Creek Basin injured by the debris and water from defendant's mine. This does not mean that the company must stop work, but that they must buy this man's land to dump tailings on, as they have bought 16,000 acres before for the same purpose. It will be a good investment, as the land will pay by and by.

Taxation of Inventors and Use of Patent Fund.

Our readers well know that Congressional attention has been yearly invited to the above subject, and kindred questions affecting the rights of intellectual property, with inadequate results. It is now evident that Congress can give that attention to the subject which its importance justifies only hy personal appeal to its individual members hy their constituents, supplemented hy a numerously signed memorial to Congress itself. In view of the assemblage of so many of those specially interested in such questions at the various expositions and conventions, and the near approach of the Congressional session, it is proper to give publicity to a draft of a memorial such as is now being circulated. It is as follows:

Memorial.

To the Honorable the Senate and the House of Representatives of the United States in Congress assembled:

The undersigned, manufacturers, inventors and other citizens, interested in the progress of the useful arts, respectfully represent:

That to the law granting to inventors, for a limited period, the exclusive use of their discoveries, the country is indebted for much of its pre-eminent prosperity;

That the surplus to the credit of the patent fund, amounting, on the first of July, 1883, to $2,500,000 in round numbers, unappropriated to any of the ostensible purposes of its exaction, constitutes a special tax upon a useful class of citizens, mostly "poor but making many rich," without constitutional sanction, and neither expedient nor just;

That the fees for granting patents of invention should not, as they have done for many years past, greatly exceed the expenses incurred in examination and other procedures called for in such grants;

That the surplus could and should be applied, under proper safeguards, to means for increasing the usefulness of the patent office, both to inventors and the public;

That among these means are adequate digests and indexes of improvements in the various useful arts, for use of the examining corps, and of inventors and others in the principal industrial centers; increase of the working force of the patent office, on salaries that shall secure and retain competent service; and enlargement of its present cramped and inadequate accommodations.

Under the present law, previous grant of foreign patents operates to limit the terms of one granted here for the same invention to that of the earliest expiring foreign one, possibly because it was thought that the American public should not he called on to pay for what was free elsewhere. The provision, while oppressive to inventors of the more important improvements, fails to accomplish the ostensible object of its enactment in the great majority of American inventions, which, because of this clause, are never patented outside of the United States, and are therefore free abroad from the first. We ask the repeal of this worse than useless clause.

Legislation is asked that shall enable amendment, after due public notice, and within reasonable time after grant, of a defective specification, without on the one hand bringing into subjection machines already constructed, or, on the other hand, releasing previous trespasses on claims remaining unchanged in the amended specification.

It is submitted that a commission be established, with authority to order such Patent Office expenditures, not in excess of receipts, as such commission may from time to time deem fit. It is requested further that the President he authorized to enter into all arrangements with other powers for the international protection of rights of inventors, such a movement having already been made by the English government in the patents, designs and trade-mark act of 1883.

The Postal Telegraph.

Facilitating the inter-communication of intelligence of all kinds is one of the secrets of recent rapid progress in civilization and enlightenment. It is one of the hopeful signs of the times that each reduction in the cost of transmitting information prepares the way for the cheapening, because the people are ready for it and avail themselves of its benefits. The Inter-National Postal Congress, which has made the letter rate five cents between nearly all the more enlightened nations of the earth, is a great step forward. The reduction of the letter rate in this country to two cents is another mark of progress which is generally appreciated, and will show its benefits in the great increase of correspondence. These aids to business and friendly communication are excellent, but they should be merely regarded as preparing the way for future facilitation of transmission.

It is high time that the advantages of electric communication were brought within the reach of all, and used for the interchange of less restricted messages than at present. As we advance in enlightenment, time becomes a more and more valuable commodity, and we can ill afford to wait for communication which creeps along in the mail cars. It should speed upon the wings of the lightning; and to secure this essential quality of speed, the public should he no longer required to pay a great profit to a few fortunate men who happen to hold shares in telegraph companies.

The time has come when the government should control and conduct communication by wire as well as by rail. The system should be extended far beyond present telegraph facilities, and the cost should he vastly reduced. This can only be done hy bringing the whole system under the government control, that it may be engrafted on the postal system. This project is now engaging the attention of publicists, and there should he a public appreciation and demand for such facilities made known. Monopoly of any thing of a public need is an unfortunate thing, but monopolizing a means of communication is perhaps the worst of all for the country. By postal telegraph the government can free the people from existing exactions of a monopoly, and it should not be long deferred.

Searching for Water.

Now that the population of our state is increasing so rapidly, the unsettled land that is watered from running streams is seen to be of very limited area. As a natural consequence, it is steadily appreciating in value, and property-owners are using every means to increase their supply of water. This is notably true in Southern California, all along the line of the Santa Ana River; at the mouth of the Canyon, where the underground flow has been appropriated to water a portion of Redlands; at the Riverside point of diversion, where the same thing has been done; and at Bedrock Canyon, where a pile dam is being constructed to secure additional water for the settlements of Orange and Santa Ana; also, at the month of San Gabriel Canyon, and in the bed of the Los Angeles River. In this connection we print an article taken from the *Herald*, of Los Angeles, bearing date 22d of September:

The Good Work Begun.

Only a few months ago the *Herald* contained an argument in favor of tunneling the Sierra Madre Mountains for water, and repeated the necessity of the project in several issues, with suggestions of a location where such a tunnel could be made with success.

To day we have the pleasure to announce that the good work has been begun in several places. Mr. James Noel, who has a fine body of land between Cucamonga and Etiwanda, has begun a tunnel six and a half feet high and five feet wide, in the mountains at the upper side of his land. Mr. Clark, who is making the same, was in town yesterday for giant-powder, tools and provisions, and reports a length of about fifty feet. About ten miles to the west of this tunnel the Chaffey Brothers are preparing to make another tunnel, to water a part of the Ontario Colony. In the rear of Sunny Slope, Mr. C. C. Hastings has begun a tunnel, on the upper side of his tract. Mr. Abbott Kinney has made a short tunnel that is yielding a fine stream of water for his ranch. Next west of the Kinney tunnel, Hon. J. F. Crank, Wm. Allen and Mr. A. Brigden have commenced a tunnel on the west side of Precipice Canyon, and have completed about forty feet of the same. It is yielding water quite freely already. About three miles west of this tunnel Messrs. Graham, Lowell, Gano and Jewett have run a tunnel into the mountains about fifty feet, and secured a beautiful stream ten inches wide and an inch and a half deep, which is carried into a reservoir near the mouth of the tunnel. The water in this tunnel comes up out of the bottom of the tunnel and in from the sides. The present supply is ample for all their needs, so that work for the present has been suspended. It was found that the water increased steadily as the tunnel was lengthened. If more water should be needed they will extend their work further into the mountain. Another recommendation in favor of this water supply is the clear and pure condition of the water as it merges from the tunnel, and the further fact that the riparian rights, as enunciated by the Supreme Court of California, can not apply to these precious streams.

When the tunnel was made for the Southern Pacific railroad at San Fernando, quite a stream of water was found where there had been no surface indications, and this stream is still steadily flowing. Every inch of water thus secured and carried to hitherto unproductive land is adding its quota to the wealth of our state; every additional acre that can be brought under cultivation is so much towards the prosperity of all; and those who are engaged in these enterprises, and carry them forward to a successful issue, certainly merit the thanks of the community.

THE MECHANICS' INSTITUTE of this city is now in a very flourishing condition. There has lately been a large increase in membership, and the recent exhibition was very successful from an industrial as well as a financial point of view. In works of reference the library is especially rich, while it is also liberally supplied with ordinary library material.

ON the headwaters of South Creek, a tributary of Little Lost River, in the northeastern part of Alturas County, Id. T., there is said to be a volcano, with a true crater, emitting hot fumes all the time, charged with sulphurous, suffocating gases. There is a horse trail leading from Cedarville via South Creek to the volcano.

MECHANICAL PROGRESS.

Poor Machinery.

Poor machinery in the saw mill, planing mill, or wood-working establishment of whatever name, says the *N. W. Lumberman*, is a delusion and a snare. It usually costs less to start with than first class work, and this difference in price is a gilded hook that catches many a man who has not learned that the best in the long run is always the cheapest. A machine that is not well made, of the best material, and that will not do the work required of it in the best possible manner, should not, in any mill or factory, be considered worth the room it occupies. The mind of the man who tends such a machine is constantly harrowed. He is on the lookout for something to break or go wrong in some way, and if it does not, the final result, the work turned out, in which an operator takes, or ought to take, the liveliest interest, is unsatisfactory, and a standing reflection on the shop or mill that produces it.

The honest manufacturer in the machine line is a jewel, and it is doubtful if his efforts are appreciated to the extent they deserve.

A saw awhile ago burst in Michigan, the pieces flying through the air like so many bullets. Owing to the best of luck nobody was injured, though the chances of death to some of the employees in the mill were probably ten to one. The sawyer declared the break was caused by a flaw that would have been detected in the process of manufacture by careful workmen; and so thoroughly does the owner of the mill believe that such was the cause, that a saw of another manufacture will grace his mandrel henceforth and forever, providing his mill runs so long. A manufacturer of machinery may easily cover a defect with paint or polish, and think he is doing a smart thing in a business way; but if he keeps his eye on his machine from year to year, and at the same time keeps his ears open, some day he may hear of an accident that involved loss of property and life, and then possibly he may think of the slight defect that he so ingeniously concealed. We don't know of a good place in existence for cheap poor machinery, except the bottom of the sea. If there, no one will use it; consequently it will neither do any one bodily injury nor assist a man, by its poor work, in getting a bad reputation.

Improperly Locating Machinery.

Apropos to the above is the following from a correspondent of the *Milling News:* During the past decade I have been in a great many mills, and have seen not a few that were admirably adapted to the business of handling and dressing lumber at a minimum of expense and labor; and I have occasionally seen one that seemed to me to have been built and arranged to see how much could be put on each job and yet have every one about the place work hard all day. In many of them it seemed as though machines had been left where they were dropped by the drayman on their first arrival. The grindstone was where the ripsaw belonged; the resawing machine should have been placed where the flooring machine was; the surface planer was where nothing should be, except perhaps a pile of lumber, and so on all the way through.

A great difference can be made in the production of work by the proper or improper location of the different machines; I mean so placing them that all the various processes, including ripping, cross-cutting, resawing, surfacing, matching and molding, can be done with the least possible amount of handling. Every time a piece of stuff is touched, carried, or handled unnecessarily, some of the profits, if there are any in the business, stick to it. It is not a hole in which to drop money, but a good surface on which to stick the needful. As an illustration, when boards are dressed on a double-surfacing machine, at a very close figure after the cost of power, grease, and help are included, where would the profits go to if the same work were done on a single surfacer feeding at the same rate? You simply stick it on the boards with good "stickem." It will stay there, and don't forget to keep this fact in your cranium.

Steel, Then and Now.

The sword was, as the ancient chronicler said, "the oldest, the most universal, the most varied of arms, the only one which has lived through time. All people knew it; it was everywhere regarded as the support of courage, as the enemy of perfidy, as the mark of commandment, as the companion of authority—as the emblem of sovereignty, of power, of force, of conquest, of fidelity, and of punishment." And all this has steel abandoned—to become rails! Look at what it was, and what it is. Its aspect was brilliant; its habits were punctilious; its manners were courtly; its connections were patrician; its functions were solemn; its contact was ennobling; even its very vices were glittering, for most of them were simply defects of its superb qualities. It is true that it was sometimes cruel, and that its process of action was distinctly sanguinary; but those reproaches apply to all other weapons, too. Throughout the ages it grandly held up its head and haughtily bore its name. It lost no caste when it allied itself with lance and dagger, with battle ax and helm, for they were of its natural kindred; and even when, in latter days, it stooped to generate such lowly offspring as razors, lancets, knives and needles, the world saw no real abasement in the act, for the chivalrous blade was still the image which represented steel to man.

But now its whole character has changed; now it has thrown aside its gallantry, its grace, its glory; now it has foresworn its pride for profit, its pomp for popularity. Steel is now bursting coarsely on the earth at the rate of thousands of tons a month. It is positively being made into steam engines, and cannons, and ships, and all sorts of vulgar, heavy, uncomely, useful objects. Worse than all, it is becoming cheap! Steel cheap! The steel of old, the steel of legend and of story, the steel of the palladin and the chevalier, the steel of the noble and the brave, the steel of honor and of might, the steel that was above price, that knew not money and cared naught for profit—that steel is no more. It has been driven contemptuously out of sight by matallurgie persons called Bessemer and Krupp, and others, and these destructive creators have put into its place a nineteenth century substance exactly fitted to a mercantile period, but possessing no title whatever with time or fame.

POSSIBILITIES OF MACHINERY.—Those who think, if there are any such, that the possibilities of labor-saving machinery, says the *Manufacturers' Gazette*, are nearly exhausted, and that the whole field of art and industry in which it may be advantageously employed has been already covered by inventive genius, are greatly mistaken. Wonderful as have already been the achievements of human ingenuity in this direction, there is no reason to doubt that it is destined to continual progress in the future as in the past, or that the coming triumphs of mind over matter will be greater and more fruitful of grand results than any which have been consummated. Reasoning from analogy and precedent, we can come to no other conclusion. Twenty, or even ten years ago, who could have guessed or believed that the difficult and complicated processes which are now every day being wrought out by machinery, in various braches of manufacture, would ever be possible? Thus it is that the unsolved problems of one generation of men become the accomplished facts of the next. And who shall say that the objects which now seem to us beyond the range of probability may not be successfully attained by those who are to come after us?

NATIVE WOODS FOR DECORATIVE PURPOSES.—A writer in the *Railroad Gazette* gives some ideas about our native woods and their uses that may be of value to our mechanics. He says that white wood is valuable because it remains where put, notwithstanding the fact that its surface is perhaps as easily affected by water as almost any wood. In Virginia there are tracts formerly known as the "Wild Lands," in which much fine forest remains—tracts where the tulip poplar, or the white wood, shows trees that will square two feet for sixty feet of length, and where the beech, oak, the hickory and the sugar-maple have never been touched. One of the finest tracts of the much used cherry tree is found along the eastern edge of the outcroppings of the coal measures of the northern part of this region. Those who have been accustomed to see the miserable, caterpillar-eaten specimens of this tree would be surprised by the splendid trees found growing in these forests—trees three and four feet over the stump and sixty feet upward before reaching a limb.

A MUSICAL ELECTRICAL WHEEL.—An experiment by Prof. H. S. Carhart is as follows: A disk of sheet iron was pierced with two circles of quarter-inch holes concentric with the disk, the number of holes in the two circles being thirty-two and sixty-four respectively. On one side of the disk was placed a horseshoe magnet, with its poles very near the rows of holes; on the other side were arranged two corresponding induction bobbins. The circuit was completed through a telephone and either bobbin at pleasure. Upon rotating the disk rapidly, a clear musical sound was produced in the telephone, the pitch rising with the rapidity of rotation. Moreover, the bobbin opposite the circle of sixty-four holes gave the octave above the other, and each gave a note of the same pitch as was produced by blowing a stream of air through the corresponding holes.

A DRIVING belt made for an Eastern cotton mill is a monster power transmitter. It is 220 feet in length, double, making 458 feet of leather three feet wide, or 1,374 square feet. When it is remembered that only about twelve square feet of the ordinary hide can be used in making belting, it may be calculated what a drove of cattle would be required to produce this one belt.

STEEL RAILS.—A manufacturing engineer writes to *La Metallurgie*, Paris, claiming that the success of rolling steel rails depends on the temperature at which the steel is rolled. He states, from his own experience, that bars which were finished at a bright-red heat, and which were recognizable after cooling by their blue tint, were more fragile under tests by striking or flexion than those finished at a lower temperature.

SCIENTIFIC PROGRESS.

Electric Furnace—Interesting Experiments.

The electric furnace possesses two great advantages—the temperature which can be produced is only limited by the refractory resistance of the crucible, and the heat is developed in the materials which are to be melted, without first traversing the recipient.

An interesting series of experiments was recently made with one of these furnaces in Paris, which are referred to by *L'Electricien*, as follows:

Six pounds of forged iron were submitted for twenty minutes to the action of the arc, and the metal was then poured into a mold. It was found to be crystalline, and could not be forged. This difficulty may be remedied by adding a little manganese before pouring out; but the reason of this action is not understood. Three-quarters of a pound of copper were melted in charcoal dust for an hour, at the end of which time all but three-quarters of an ounce had been vaporized. The persons who were present did not perceive any disagreeable effects from the atmosphere which they were obliged to breathe. Eight pounds of platinum were entirely melted in about a quarter of an hour. A half pound of powdered tungsten was submitted to the action of the electric arc, in a clay crucible. Very dense fumes escaped, and a cavity about a half inch deep formed at the summit. The metal appeared to have been melted to only a very slight depth below the cavity. The unmelted portion was covered with very beautiful crystals, which, when examined by a microscope, were found to be prismatic, but they were not very uniform. The crystals were evidently formed by the slow cooling of the distilled vapor. Experiments were tried with various other metals, showing that the quantity of any given metal which can be completely melted in an electric furnace, and the time required for the fusion, depend upon the interval between the point of fusion and the point of vaporizing, as well as upon the thermal conductibility of the metal. Thus it happens that platinum is melted much more easily than steel, and in a much greater quantity for the same expenditure of energy.

Late Observations on the Planet Jupiter.

Among the papers read before the recent meeting of the American Association for the advancement of science was one upon the planet Jupiter, by G. W. Hough, of Chicago, in which he remarked that the rapid motion of revolution of the planets, by changing the positions of the markings on the surface to our line of sight, makes great apparent differences in their shapes and sizes. This has perhaps been the occasion of reports of sudden and great changes upon the surface. The changes are not sudden, but are gradual; and many of the features are permanent. Minor changes are constantly in progress in the equatorial belts.

The author recently observed the belt drifting down toward the red spot, but, although it partly surrounded it, they did not coalesce, and the spot forced a scallop into the belt, a very curious phenomenon. The author saw a satellite pass over this red spot, though the satellites are not visible when on the white part of the disk. He had also had a chance to compare shadows of satellites on the disk and on the spot, and both are dark.

The red spot has seemingly retrograded during the past four years; that is to say, the rotation of Jupiter has seemingly increased from 9 h. 55 m. 33 s. to 9 h. 55 m. 38 s. The future observer should attend more carefully to what he sees, and theorize afterward.

RECENT CHEMICAL APPLICATIONS OF ELECTRICITY.—Among the electrical processes which encourage great hopes for the future, those which bear upon the industry of chemical products and the preparation of metals have been somewhat overlooked. It is well to remember that the dynamos, in the estimation of their inventor, were designed to take the place of batteries in galvanoplasty before they were applied to the numerous uses of lighting and of mechanical transmission. Industrial chemistry will undoubtedly draw advantages from the resources which are offered by the electric current. The last international electrical exhibition showed how to prepare metals, chemically pure, to extract the precious metals from their salts or their alloys, to treat ores, and to form some special combinations for dyeing. While the French houses were spreading before our eyes the wonders of artistic galvanoplasty, Letrange published his researches upon the preparation of zinc, Wohlwill displayed a wonderful collection of metals deposited electrically, and Goppelsroder, with the modesty of a savant, presented specimens of colors obtained by electrolysis.—*L'Electricien.*

AZOTINE.—M. Heddehault has discovered a method of preparing soluble wool from tissues in which wool and cotton are combined. When subjected to a current of superheated steam under a pressure of five atmospheres, the wool melts and falls to the bottom of the pan, leaving the cotton, linen, and other vegetable fibres clean and in a condition suitable for paper-making. The melted wool is afterwards evaporated to dryness, when it becomes completely soluble in water, and is called azotine. The increased value of the rags is sufficient to cover the whole cost of the operation, so that the azotine is produced without cost. It contains all its nitrogen in a soluble condition, and can, therefore, be compared to dried blood, which is worth 2.50 francs per kilogramme of nitrogen. M. Ladurean regards this discovery as one of great interest for agriculture and mechanical industry.—*Soc. Industr. du Nord.*

MAGNETISM OF STEEL AT DIFFERENT TEMPERATURES.—It is well known to electricians that the best steel makes the best permanent magnet. But the magnetism of steel depends on how hot or how cold the metal is. For example, steel loses its magnetism if subjected to a temperature of 100 below zero it also loses its magnetism when heated to yellow heat; that is, between red and white heats. Soft iron, when heated red hot, is not attracted by a magnet. Prof. Poloni has recently been experimenting upon the influence of heat on the permanent magnetism of steel. He finds that the diminution of magnetic intensity by the increase of temperature in the steel bar has no rigid relation to the increase of electric resistance in the metal itself. Indeed, while the permanent magnetism diminishes with increasing rapidity up to a temperature of about 200° (328° F.), and then less rapidly up to 300° (508° F.), becoming inappreciable at red-heat, the electric conductibility of the iron diminishes uniformly with the increase of temperature.

MODIFICATIONS OF GLASS AT MODERATE TEMPERATURES—Messieurs Crafts and Pernet have presented some recent communications to the French Academy relative to the changes which glass tubes of thermometers undergo when they are heated for a long time. In manufactories of printers' ink, where oils are heated to a temperature of 270° (538° F.) for many days, the most accurate thermometers often become so changed as to indicate errors of ten or more degrees. J. Salleron calls attention to similar changes at much lower temperatures. The areometers which are employed in sugar refineries where molasses is treated by osmosis, are plunged for many days in liquids which are heated to 95° (203° F.). Although this temperature is below the boiling point of water, it is sufficient to completely modify the areometers and to soften the glass enough to make them untrustworthy.—*Comptes Rendus.*

CONCENTRIC LAYERS OF TREES.—It is generally thought that the age of trees may be known by the number of concentric layers. This principle, however, is not applicable to tropical trees, as is shown by the following facts: When M. Charency visited the ruins of Palenque, Mexico, in 1859, he cut down several trees in order to get at the great pyramid. On revisiting the same locality in 1881, the shoots which had grown from the stumps, and which must all have started nearly at the same time, varied greatly in the number of their concentric layers. On one he counted 230; and the entire number had been formed inside of twenty-two years. On one occasion he cut off the branch of a shoot which he judged to be about eighteen months old, and counted eighteen concentric layers, one for each month of growth.

SPECTROSCOPIC ESTIMATES OF ATMOSPHERIC ABSORPTION.—Cornu has been led, by his investigations of the atmospheric absorption of the ultra-violet rays, to examine the relation between that phenomenon and the absorption of the visible rays. His attention was especially directed to Brewster's dark bands, which are generally known as telluric rays, the intensity of which increases with the thickness of the atmosphere which they traverse. He finds that the amount of absorbing matter may be estimated by the sines of the altitude from the sun at which a telluric ray has the same intensity with a metallic ray. Hence may be deduced a very simple method for estimating, at any moment, the total amount of vapor which exists in the atmosphere.—*Comptes Rendus.*

ELECTRIC CURRENTS PRODUCED BY NITRATES.—M. Brard has communicated some investigations to the French Academy, which give the following results: 1. On plunging a red-hot carbon into a bath of melted nitrate, an energetic current flows from the bath into the exterior circuit; 2. The melted nitrates become very fluid, and, like greasy bodies, lubricate the heated bodies with which they come in contact; 3. In order to obtain a current, it is not necessary to plunge the carbon into the nitrate bath, but it suffices to place a metal capsule containing some grains of the melted nitrate upon the burning carbons. M. Brard is continuing his experiments with a view to apply them practically in the production of light and heat.—*Les Mondes.*

DURATION OF WOOD AND IRON UNDER WATER.—German engineers are now engaged in removing the foundations of an old bridge built by Charlemagne, in the eighth century. The wood of the piles, used in its construction, although nearly 1,100 years old, is so well preserved that it can still be used in building; the iron, which was riveted to the posts, can also be used, since it is covered only with a thin layer of rust.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY TUURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Best & Belcher M Co	Nevada	27	50	Sept 18	Oct 24	Nov 16	William Willis	309 Montgomery st
Benton Con M Co	Nevada	11	10	Nov 1	Dec 6	Dec 24	W H Watson	302 Montgomery st
Buena Vista Petroleum Co	California	31	25	Oct 30	Dec 5	Dec 27	L Kennann	220 Sansome st
California M Co	Nevada	9	20	Oct 1	Nov 7	Dec 5	C P Gordon	309 California st
Champion M Co	California	13	10	Oct 8	Nov 15	Dec 8	Theo Wetzel	522 Montgomery st
Con Amador M Co	Nevada	6	50	Sept 15	Oct 20	Nov 13	F B Latham	408 California st
Campo Seco Copper Co	California	2	10	Aug 10	Oct 1	Nov 12	E M Hall	309 Montgomery st
Day S M Co	Nevada	13	30	Sept 7	Oct 15	Nov 12	E M Hall	327 Pine st
Elko Con M Co	Nevada	2	15	Oct 6	Nov 12	Dec 4	F Sperling	309 California st
Eureka Con M Co	Nevada	7	10	Sept 27	Nov 10	Nov 30	A F Main	418 Jackson st
Eintracht Gravel M Co	California	13	05	Sept 11	Oct 17	Nov 5	H Kunz	329 Sansome st
Eureka Con M Co	Nevada	6	1.00	Sept 23	Oct 22	Nov 12	P Jacobus	309 Montgomery st
Hale & Norcross M Co	Nevada	78	50	Sept 11	Oct 16	Nov 6	J T Lightner	309 Montgomery st
Henrietta Gravel M Co	California	7	12	Oct 23	Nov 23	Dec 14	L Gross	530 Washington st
Mayflower M Co	California	20	15	Oct 4	Nov 6	Nov 22	J Morizio	328 Montgomery st
Martin White M Co	Nevada	16	25	Sept 22	Nov 7	Dec 6	J J Scoville	309 Montgomery st
McElroy Gravel M Co	California	11	25	Oct 25	Nov 30	Dec 28	J T Fogarty	806 Montgomery st
Mexican M Co	Nevada	24	1.00	Sept 17	Oct 23	Nov 13	C L McCoy	309 Montgomery st
Pleasant Valley M Co	California	2	15	Sept 8	Oct 16	Nov 3	C E Elliott	327 Pine st
Ruby Hill Gravel M Co	California	9	25	Sept 3	Oct 20	Nov 12	H Pecham	320 Sansome st
Trinity G M Co	California	1		Sept 15	Oct 22	Nov 6	L Wadham	309 California st
Union Con M Co	Nevada	24	50	Oct 15	Nov 20	Dec 11	J M Buffington	309 Montgomery st
Utah S M Co	Nevada	46	1.00	Oct 11	Nov 19	Dec 3	G G Pratt	410 Front st
Wiuthrop M Co	California	1	25	Sept 17	Oct 23	Nov 16	H Wright	337 Pine st
Yaqui M Co	Mexico	2	10	Sept 12	Oct 17	Nov 7	T T Atkinson	

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Bodie Tunnel Co	California	C C Harvey	309 California st	Annual	Nov 12
East Mt Diablo M Co	California	G W Fisher	306 Pine st	Annual	Nov 7
Great Western G M Co	California	A Halsey	323 Montgomery st	Annual	Nov 6
Little Chief M Co		S C Dean	22 California st	Annual	Nov 12
Peck M Co	Arizona	C T Budge	224 California st	Annual	Nov 15
Trinity G M Co	California	L Wadham	528 California st	Annual	Nov 5

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Bulwer Con M Co	California	W Willis	309 Montgomery st	15	July 2
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	July 19
Mt Diablo M Co	Nevada	R W Heath	318 Pine st	25	Oct 25
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	Oct 12
Silver King M Co	Arizona	J Nash	315 California st	25	July 12

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Oct. 10.		WEEK ENDING Oct. 17.		WEEK ENDING Oct. 24.		WEEK ENDING Oct. 31.	
Alpha	2.25	2.10	2.50	2.10	2.15	1.90	2.00	
Alta	1.50	1.40	1.40	1.60	1.25	1.65	1.30	1.60
Andes	.55	.40	.55	.50	....	.65	.65	.70
Albion	.35	.40	....	....	....	....	....	.40
Argenta	.20	.25	.15	.40	.15	.20	.15	.20
Atlas	....	....	....	....	....	....	....	....
Belcher	1.15	1.35	1.20	1.45	1.10	1.25	1.00	1.15
Belding	....	....	....	....	....	....	....	....
Best & Belcher	3.15	3.30	3.10	3.90	3.65	4.00	3.60	3.90
Billion	....	.85	.80	1.00	....	.90	....	.85
Bechtel	....	....	....	....	....	....	....	....
Belle Isle	....	....	.40	.50	.40	.50	.40	.45
Bodie Con	.50	.55	.40	.70	.50	.65	.25	.40
Benton	....	....	.20	.25	.15	.20	.15	.20
Bodie Tunnel	....	....	....	....	....	....	....	.10
Caledonia	....	....	....	....	....	.15	....	.15
California	.15	.20	.15	.20	.10	.10	....	.10
Challenge	....	....	....	.35	....	.35	....	.35
Chollar	2.65	2.95	2.20	3.00	2.25	2.70	2.25	2.40
Confidence	1.85	1.90	....	....	1.60	1.75	....	....
Con. Imperial	....	.10	....	....	.10	....	....	....
Con. Virginia	.45	.50	.50	.60	.45	.60	.45	.55
Crown Point	1.30	1.45	1.20	1.40	1.20	1.30	....	1.20
Day	....	.35	....	....	....	....	....	....
Elko Con	....	.10	....	....	....	....	....	....
Eureka Con	.65	6.00	4.50	5.00	4.25	5.00	4.15	2.25
Eureka Tunnel	....	.10	....	.15	....	.10	.05	.10
Exchequer	.55	.65	.50	.65	.40	.55	.40	.50
Graud Prize	.25	.60	.50	.55	.50	.55	.45	.65
Gould & Curry	2.20	2.40	2.10	2.35	1.75	2.35	1.80	2.00
Hale & Norcross	3.50	4.00	2.25	3.85	2.30	2.80	2.00	2.40
Holmes	....	....	....	....	....	....	....	....
Independeuce	....	....	....	....	.40	.45	....	....
Julia	....	....	....	.05	....	....	....	.05
Justice	.50	.45	.40	.45	.25	.40	.25	.35
Jackson	....	....	....	....	....	....	....	....
Kentuck	....	....	....	....	....	....	....	....
Martin White	....	....	....	....	....	....	....	.25
Mono	....	....	....	....	....	....	....	....
Mexican	2.25	2.50	2.25	2.70	3.20	3.50	3.05	3.35
Mt. Diablo	....	.25	4.00	4.50	....	4.00	....	4.00
Mt. Potosi	....	....	....	....	....	....	....	....
Nonuday	....	....	....	....	....	....	....	....
Northern Belle	....	5.00	5.00	5¼	4.00	4.25	....	4.25
North Noonday	....	....	....	....	....	....	....	....
Navajo	2.70	3¾	3.25	4.50	4.10	4.80	3.35	3.65
North Belle Isle	.40	.50	.40	.70	.60	.65	.55	.60
Occidental	....	1.50	1.50	1.60	1.10	1.50	1.00	1.40
Ophir	3.60	4.70	4.55	6.75	5.50	5¾	5.75	5¾
Overman	.35	.40	....	.40	.35	.40	....	.30
Oro	....	....	....	....	....	....	....	....
Potosi	.95	1.15	.90	1.15	.90	1.05	.85	.95
Pinal Con	....	....	....	....	....	....	....	....
Sauge	1.45	1.55	1.10	1.50	1.00	1.25	.85	.95
Seg. Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	3.95	4.35	4.15	4.60	3.65	4.25	3.65	4.00
Silver Hill	....	....	....	....	....	.10	....	.05
Silver King	....	....	....	....	....	7.50	....	8.00
Scorpion	.55	.60	.60	.65	.50	.60	....	.50
Tuscarora	....	....	....	....	....	....	....	....
Union Con	3.80	4.40	3.85	4.20	3.50	3.90	3.55	3.70
Utah	1.90	2.10	1.90	2.40	1.60	1.90	1.70	1.80
Ward	....	....	....	....	....	....	....	....
Wales	....	....	....	....	....	....	....	....
Yellow Jacket	3.20	3.65	3.25	4.00	3.15	3.40	3.30	3.50

Sales at San Francisco Stock Exchange.

THURSDAY A. M., NOV. 1. | AFTERNOON SESSION.

950 Alta 1.30@1.35
150 Andes 70c
50 Albion 40c
70 B. & Belcher 3.35
250 Chollar 2.30@2.35
370 Crown Point 2.30@2.35
2200 Con. Virginia 50c
400 California 30c
145 Eureka Con 4.20@4.40
200 Gould & Curry 1.90
700 Grand Prize 55@60c
155 Hale & Nor 2.25
300 Justice 30c
130 Mexican 3.25
250 Ophir 6.55
85 Overman 30c
50 Occidental 1.40
100 Sierra Nevada 3.90
60 Scopion 50@55c
200 Savage 90
50 Utah 1.70
200 Union 3.65@3.70

1400 Alta 1.30@1.55
270 Andes 70c
200 Argenta 20c
100 B. & Belcher 3.90
100 Belcher 1.10
50 Bullion 90c
150 Bodie Con 35c
140 Chollar 2.35
500 California 10c
200 Caledonia 15c
380 Con. Virginia 55c
870 Exchequer 40@45c
20 Gould & Curry 1.90
800 Grand Prize 60c
230 Hale & Nor 2.35
100 Mexican 3.25
100 Navajo 3.55
100 N. Belle Is 55c
100 Potosi 90
100 Savage 95c
305 Sierra Nevada 3.95
375 Union Con 3.70@3.80
120 Yellow Jacket 3.30@3.35

THE ÆTNA IRON WORKS have undertaken the manufacture of the Nevin patent ore furnaces. The proprietors of these works being experienced in metallurgical appliances, consider this furnace to be an excellent one, and feel assured it will give very satisfactory results. They intend introducing it more widely on this Coast.

BECAUSE of a great sum in the treasury and a rapidly increasing Assessor's valuation of property, the Texas Legislature has a special session next month to reduce the rate of taxation.

Mining Share Market.

Matters in the stock market have been very dull this week. Fluctuations have been slight; as soon as any ore stock starts up a little there are plenty of sellers, so no rises of any importance have occurred. The work of sinking the joint Union Consolidated and Sierra Nevada winze proceeds as rapidly as possible, but the rock is exceedingly hard and tough. It is a very diffieult matter to drill and blast it. However, the ore increases as sinking progresses and the sinking of the winze is watched with interest. At the Gould and Curry and Best and Belcher, on the 2500 level, a joint winze has been started on the line between the two mines, in east cross-cut, No. 1. This winze will be sunk to the 2700 level, if possible. The cross-cuts made to the southward on this level show that the vein is strongest to the north. In Gold Hill the several companies are taking out a considerable amount of ore in the aggregate, but none have yet put on a full force of miners, and will not do so until the mills on the Carson River can be run to their full capacity.

Bullion Shipments.

Contention Con., October 20th, $16,206; Mt. Diablo, 22d, $11,245; Horn Silver, 23d, $18,000; Ontario, 23d, $10,849; Hanauer, 24th, $12,500; Crescent, 24th, $2,100; Horn Silver, 24th, $12,000; Ontario, 24th, $5,166; Hanauer, 25th, $5,300; Horn Silver, 25th, $6,000; Ontario, 25th, $5,049; Hanauer, 26th. $2,783; Nevada, 26th, $1,650; Ontario, 26th, $5,107; Horn Silver, 26th, $12,000; Ontario, 27th, $4,650; Vienna, 27th, $1,521; Bullionville, 27th, $10,886; Horn Silver, 27th, $6,000; Ontario, 28th, $5,137; Vienna, 28th, $1,588; Horn Silver, 28th, $9,000; Bullionville, 28th, $2,501. The banks of Salt Lake City report for the week ending October 24th, inclusive, the receipt of $158,253.90 from the mines, mills and smelters, of which $156,153.90 was bullion, and $2,100 ore.

A BIG STEAL.—Speaking of the Cable mine, Deer Lodge County, Montana, the Heleua *Herald* says: In a comparatively small body of white quartz, of less than two tons weight, very nearly $80,000 was secured and made off with by a number of the men employed in the development force. Of this large amount of treasure only about $6,000 was recovered by the owners. The guilty one, caught, confessed to the theft, disgorged his part of the plunder, and implicated those who had shared in the robbery, and the amounts they, one after another, skipped the country with. This man was let go;—a condition to the confession and the giving up of his share of the stealings. His associates had scattered, and placed themselves beyond reach,—in the States, in Canada, and one at least put the sea between him and America. The theft was first unmasked by one or more of those concerned in it heedlessly sending numbers of rich specimens to Helena, where they were disposed of at high figures. For one of these quartz pieces of less than a pound weight a suit of clothes, with an overcoat added, were exchanged. Several of these rich and beautiful specimens of white quartz, with protruding gold upon all sides of them, adorn a number of Helena cabinets.

THE river Salembria, in Thessaly, anciently known as Peneus, has overflowed its banks, causing widespread devastation. One hundred houses have been destroyed and several lives lost. Larissa and the villages in its vicinity are surrounded by water.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

SUTTER CREEK.—*Ledger*, Oct. 27: Last week a rich pocket was struck in the Iowa mine, at Sutter Creek, adjoining the Mahoney on the east. The mine has been operated on a small scale by A. Tibbetts and J. Tucker, with varying results. Last week they stumbled across a little bonanza, taking out in a short time gold worth from $12,000 to $17,000.

PLYMOUTH CON.—The Plymouth Con. Mining Co., on the 3d inst., declared its fifth monthly dividend of 50 cents per share, aggregating $50,000. Making a rough estimate of the running expenses, the two mines—Pacific and Empire—must be surrendering gold at the rate of over three-quarters of a million per annum.

NOTES.—John Poll has been working a claim in Murphy's Guleh. He lately had 12 tons of the ore crushed at the Oneida mill, which surrendered $9 per ton. The ledge is not more than a foot wide, but it is near the surface. The Zeile mill crushes from 100 to 125 tons of ore per day. Estimating the average yield at $8 per ton, including sulphurets, the product of the mine can not fall short of $27,000 per month.

DRYTOWN.—*Dispatch*, Oct. 27: We learn that Alvinza Hayward has purchased the Seaton mine at Drytown, and intends to work it on a more extensive scale than heretofore. Humphrey Reese of Sutter Creek has been placed in charge as Superintendent.

Calaveras.

TUNNEL RIDGE.—*Chronicle*, Oct. 27: J. F. Vieth, who owns the Mammoth hydraulic claim, on Tunnel Ridge, is preparing to have erected a 5-stamp gravel mill. There is rich gravel in the Mammoth, but some of it is cemented, requiring stamps to free the gold.

WEST POINT.—Cor. *Citizen*, Oct. 27: The Star of the West has stopped for a short time, until the owners get a new pump. Mr. Wiekham is building a 20-stamp mill for Mr. Richardson. The Scorpion mine, owned by Mr. Carey, is running. The Valentine mine, owned by Messrs Ayers and George, is not running at present. The Old Wood House mine is now running under the management of Mr. Desmond. The Champion mine is shut down.

MURPHY'S.—*Mountain Echo*, Oct. 24: The addition of one more Tustine pulverizer, making four, and one more Frue concentrator, making six, will, by using a 30 screen, make the capacity of the mill 40 tons per day. These screens will be used for the low-grade ore that has accumulated on the dump. A thousand tons were freed in a two weeks' run, which will pay $8 per ton.

Del Norte.

BIG FLAT.—Crescent City *Record*, Oct. 20: During the dry season the fitting up of the Big Flat mine for the coming winter has been going on. This is the best mining property near the coast in this county, and we shall expect to hear of a large amount of gold being taken out. Under the management of Paris & Lane, nothing has been left undone. Unlike the Boston Co., that first opened this mine and failed, they do not support 2 or 3 overseers and a number of "hightoned" bosses, but attend to their business themselves.

Mono.

MAY LUNDY.—Homer *Index*, Oct. 27: The May Lundy mine is turning out 420 tons of ore per week, but the snow-squall of Thursday caused a suspension of hauling, teamsters being afraid to venture up the mountain. At the mine stoping is being done in stopes 1 and 8 from the middle tunnel, 13 and 14 from the lower tunnel, between winze 1 and 2, 60 ft below, and from the south winze 1, 130 ft below the lower tunnel. All these stopes are looking well and carrying from 3 to 8 ft of ore.

GORILLA.—The Gorilla M. and M. Co. has laid in a large supply of ore at the reduction works, and the works were this week put in thorough repair. It is understood that the clean-up last Monday and bullion shipment on Tuesday were unexpectedly large.

STANDARD CON.—Bodie *Free Press*, Oct. 23: During the week there were shipped to the mills 1305 tons of ore. The bullion shipment was valued at $18,293.98. No work was done on the 1200 ft level during the past week, owing to the water having risen 12 ft in the shaft. At first the water gained on the pumps about 2 ft a day, but now the pumps are handling it as fast as it comes in.

Nevada.

MT. AUBURN MINE.—*Transcript*, Oct. 26: The mine up to two weeks ago looked badly, and the Eastern owners, concluding it would not pay to further prospect the ground, sent word on accordingly. The day before the letter was received, a new chute of ore was discovered. It had a very fine appearance, but the superintendent discharged 7 men until he had received further advices. He concluded to push ahead on the new discovery and stopped all other work. He has kept 10 men constantly employed. The ledge is considered to be the mother lode, and its discovery is considered of the most important character. On Wednesday last it was 4 ft thick and has the appearance of being rock of very superior quality. One of our best mining men examined it a few days ago and pronounces it as fine a prospect as any seen in this district.

MURCHIE MINE.—Supt. Tilley has been straining every point to find a large pay chute which he concluded must exist somewhere in that locality. On Thursday of last week he discovered the long looked for ledge at the bottom of the 700 level, the lowest depth the shaft had attained. Since then work has been prosecuted to the west on the ledge and it is a valuable property.

MAGENTA.—Grass Valley *Union*, Oct. 25: The existence of a ledge parallel to the Magenta has been known a long time, and on Tuesday, in running a tunnel from the ravine below the hoisting-works to draw off the surface water this ledge was encountered within 25 ft of the shaft, and found to be 4 ft in thickness, carrying galena and sulphurets and a showing in free gold. It is one of the best ledges that has been brought to light in many a day. The visitors all passed favorable opinions upon its appearance, believing it would yield from $30 to $40 per load.

Placer.

PENNSYLVANIA FLAT.—Placerville *Republican*, Oct. 20: A correspondent writing from the above camp, just over the line in Placer county, says of the Ralston brothers: The property consists of placer and hill mines, situated two miles from the mouth of Long canyon and four miles up the ridge, between the south and middle fork of the American, together with twenty miles of ditch. The water is taken out of the middle fork at the lower end of the Freneh meadows. The Ralstons have spent a considerable sum of money the past summer fixing up their mines. They have built a saw mill, barn and a commodious dwelling house. Mrs. Ralston, with her daughter and servant girl made the trip from Georgetown on horseback, over as rough a trail as is found in the mountains. The wire suspension bridge being put across the south middle fork by the Ralstons and some sheep men will be completed in about two weeks. This will enable them to travel between the mines and Georgetown at all seasons of the year.

BALD MOUNTAIN—The Bald Mountain mine at Roberts' Flat, twenty-five miles above Sunnysouth, is causing a flutter in mining circles, by the rich yield. It is said that no less than 40 ounces of coarse gold were taken out of a carload and a half of gravel, about two weeks ago. Among the owners are J. H. Neff and A. Dolt.

THE COPPER CO.—*Herald*, Oct. 20: Speaking of the California Copper mine located near the old Whisky Diggings in Placer county, the *Union* says that work at the mine is progressing very rapidly. The foundation timbers and the machinery are all on the ground, and hoisting and pumping by steam will soon begin.

Plumas.

THE COMING CAMP.—Greenville *Bulletin*, Oct. 24: There will be a big mining camp down on the east branch of the Feather River before long. The work of development is going on. An experienced mine foreman says that there is ore enough in sight at the Halstead mine to run 100 stamps during 20 years, and all of it will pay.

COPPER.—A new deposit of copper ore has been found by David Allen, in North Arm. Mr. Allen has prospected it over a length of 1,000 ft, and finds it to be at the surface from 18 inches to 3 ft in width.

EMERALD DISTRICT.—Quincy *National*, Oct. 27: A. B. Harvey, of Taylorville, gives us a very encouraging account of the mines in Emerald district, known as Lucky, S. No. 1 and No. 2. The tunnels show rich rock. Mr. Harvey, who is in charge of the mines, is fully prepared for winter, having all needed comforts for his men, and a dump-house which will contain 500 tons of quartz.

RICH GULCH.—A. D. Hallsted tells us that matters at the mine are in good shape. The lower tunnel is within 40 or 50 ft of the ledge. The work above has developed some very rich rock in the past week or two, and a vein over 2 ft in width, in the main ledge, shows gold throughout. The arastra is not yet running, but will soon be ready for work.

The Greenville *Bulletin*, as will be seen above, speaks of this mine as "the coming camp".

San Bernardino.

HUMBUG.—Calico *Print*, Oct. 27: There are between 3,000 and 4,000 tons of ore on the dump that will mill several hundred dollars a ton. Only 5 or 6 men take out between 30 and 40 tons a day. A blast was put in recently that broke up 400 tons of ore. It took nine days to reduce this to small pieces and wheel it to the dump. It was nearly all good ore. The drill hole was 12 ft deep. After the discharge of a blast the earth for 20 ft square looks as though an earthquake had filled it with cracks. Some of the assays go as high as $10,000 or $15,000 to the ton. While in the assay office belonging to the mine, we saw a button from a quarter-ounce assay weighed that amounted to $2,652.34.

THE STREAK.—Week before last we mentioned a rich strike made in the Oregon claim. This claim has been purchased by Messrs. Hasbrouek and others, and re-christened the "Streak." The discovery was made by Mr. Hasbrouck, while grading a road. The ore first taken out was very rich, but was not assayed, it being considered unnecessary. Some of the ore, considered to be second-grade, was assayed, with a result of $400 to the ton.

MORNING BROW.—Some fine ore is being taken out. The pocket first discovered was quite rich. About 1½ tons were sent to San Francisco, that netted the owners $300. A wagon-load of second-grade ore that it was thought would mill about $400 to a ton was sent to the Oro Grande mill, and yielded $1,300 a ton.

WATERMAN.—Calico *Print*, Oct. 20: There are 60 men at work in and about the mine. The lowest depth that has been reached is 430 ft. Preparations are being made to erect steam hoisting-works over the main shaft. The mill, 3 miles from the mine, on the line of the railroad, is running night and day. The dividends, after paying all expenses, amount to $560 per day.

Shasta.

WHISKYTOWN.—Cor. of *Courier* Oct. 20: The Shasta mine is worked steadily, and rich rock taken out. They have found in the north drift a 5-foot ledge of good milling ore, and are running a tunnel to tap the ledge. The Phœnix mine is not in operation. The Phœnix mill is running on ore from the mine. The mill is a 10-stamp water-power mill. The West End mine, bonded 6 months ago, has been rebonded for the same amount. Some good rock has been taken out. Work continues on the Red Rover. A good ledge has been found, and a road will soon be built to the Phœnix mill. The Bell and Woodward mine, several years ago supposed exhausted, has again come to the front with a 3-foot vein, paying from $15 to $100 per ton. The Banghart mine still continues in operation.

NOTES.—Cor. of Redding *Free Press*, Oct. 20: Quartz is still booming. Dan O'Neil will commence running his arastra in a few days. Middleton & Wolcott are still at work in their mine. Their mill is going only a few hours each day, owing to the scarcity of water. George Martin is at work on his ledge, and is getting very rich rock. Mr. Fleming has a fine ledge, 4 ft wide, and gold may be seen glittering all through it. Myers and Co. are building a road to their mine, and will erect a couple of arastras.

Sierra.

ALLEGHANY.—Downieville *Tribune*, Oct. 25: Chinese miners have been employed in the Rain-

bow mine at $2.50 per day in preference to white men at $3. The citizens are thoroughly aroused, and determined that Chinese labor shall not gain a foothold. Last Sunday a meeting was held. It was decided upon to organize a Miners' Union, and in a few hours over 50 signatures were obtained to a petition calling a meeting for that purpose Tuesday night.

ALASKA MINE.—The hoisting works of the Alaska mine, at Pike City, are completed. The new building is 82x35 ft and is very substantial. The boiler and engine were placed in position last week. It is expected to have every thing in shape to begin the work of pumping out the shaft next week.

BULLION.—One hundred and ninety-five ounces of gold have been taken out of the South Fork mine, at Forest City, by the Bald Mountain Extension Co., during the past two weeks.

Trinity.

BUCKEYE. *Journal*, Oct 27: Rowles & Diener are in 70 ft with their tunnel on the Skidmore lode, at the forks of Buckeye, which they expect to strike in 30 feet more at a depth of 100 ft. The ledge is rich on top, and widened as they went down. Tourtellotte & Smith have struck their ledge on Haylock Gulch, about a mile from the Skidmore, and found it 2½ ft wide and prospecting well.

TRINITY CENTER. Some good pay grit has been found on Fool's Gulch and Moore & Co. are fitting up their claim. Bloss & McCarey have made the most successful run they ever had. The China Co. back of town are doing very well. Dockery & Co. are running the Julien which had been shut down for some time, and have good prospects. Holland & Rumfelt intend working all winter on the east fork of Coffee Creek. This mine pays regular dividends.

Tuolumne.

HORSESHOE BEND.—Sonora *Democrat*, Oct. 27: In early days Bostwick's Bar, just below Horseshoe Bend on the Stanislaus river, was immensely rich in placer gold. A swarm of miners worked there, and took out vast sums. The river bed around Horseshoe Bend was also found to be exceeding rich, but little of the ground could be worked on account of the difficulty of handling the water in the river channel. The river bed now prospects splendidly everywhere. Just above the bend, at Reynold's Ferry, James Rolleri has built a wing dam, and is working a portion of the river channel by means of a derrick and China pumps. Although he has many disadvantages to encountered he is making from $8 to $10 per day to the hand. All the river channel between the ferry and Bostwick's Bar prospects equally as well as Rolleri's claim, and the distance is over 2 miles. Some parties have lately taken hold of the matter, and contemplate running a tunnel through the neck of Horseshoe Bend and turning the river. The distance to be run is 900 ft, nearly 400 ft of which would be an open cut. The engineers estimate that the tunnel can be put through for $15,000 or less. When the river is once turned 2 miles of the river channel, most of it virgin ground will lie bare for working.

SNELL MINE.—This mine, situated above Knight's Creek on the Stanislaus, is looking well. A shaft 100 ft in depth has been sunk. A drift has been run north from the shaft on the vein for 75 ft. About 200 tons of ore that prospects well is lying on the dump.

PATTERSON.—Some exceedingly rich rock, so report says, is being extracted from the Patterson mine. The quartz is said to be fairly alive with free gold.

NEVADA.

Washoe District.

HALE AND NORCROSS.—*Enterprise*, Oct 27: The southwest drift on the 2700 level is being advanced in material of a promising character. It is now being turned towards the west. An east cross-cut is being run from the northwest drift on the 2700 level, and is showing some ore of a good quality.

UNION CON.—Are sinking the joint Sierra Nevada winze to the point at which will be opened the 3100 station. The ground is very hard and tough, making it very difficult to drill and blast. The ore still holds out strong at the bottom, and is being saved for reduction.

COMBINATION SHAFT.—The station for the new hydraulic pump is completed, and they are now leveling down the rock for the timbers on which the machinery will be set up. One week from to-day the time expires in which the machinery is to be completed by the contractors at San Francisco.

MEXICAN.—Are opening out and completing the connection between the raise from the 2900 and the winze down from the 2700 level. The north drift on the 3100 level is being extended at the rate of over 30 ft per week.

CROWN POINT.—Sufficient ore is being extracted to keep going the few stamps that can be run at the river mills. The extraction of ore will be increased as soon as there is sufficient water in the Carson River to run the mills to their full capacity.

BENTON.—The draining of the Alta also drains this mine. As the water will now soon be out, prospecting can again be proceeded with.

ALTA.—The water is pumped out to within 20 ft of the 2150, the lowest level. Once all the water is out, they will soon be in a position to resume prospecting.

BEST AND BELCHER.—Good progress is making in the joint Gould and Curry winze, just started in east cross-cut No. 1 on the 2500 level. It was yesterday down 15 ft. It will be sunk to the 2700 level.

IMPERIAL.—Good headway is making in the west drift recently started on the 600 level. It will pass through new ground for a long way before reaching the old workings.

SIERRA NEVADA.—The main north drift on the 2900 level has reached a point from which a raise will be made up to the 2700 level.

GOULD AND CURRY.—The new winze in east cross-cut No. 1 joint with Best and Belcher is down 15 ft. It will be sunk to the 2700 level.

YELLOW JACKET.—Some ore is being extracted right along from the sagebrush level. A large amount of ore can be extracted from the mine, once the mills can take and reduce it.

UTAH.—West cross-cut No. 2 on the 1350 level is passing into a promising formation of quartz, clay and porphyry. At this point the mine has been very little explored.

OPHIR.—Are extracting ore from the 150 level, which will pay for milling. It comes from the old fillings. Exploring drifts are still being run.

BELCHER.—Not much is as yet being done in the way of extracting ore, as the mills on the Carson River can run but a few stamps.

ANDES.—Are still extracting some ore from the north drift. The drifts from the winze show some fine-looking quartz.

CALIFORNIA.—Are repairing the joint Con. Virginia winze station on the 2500 level.

OVERMAN.—Some low-grade ore is still being extracted from the old upper levels.

CON. VIRGINIA.—Are repairing the joint California winze station on the 2500 level.

UNION SHAFT.—Are still casing the timbers at the 2300 station.

Belmont District.

BELMONT MINE—*Courier*, Oct. 20: The Belmont Mining Co. have expended a considerable amount of money in repairing the mill south of town and in building and fitting up the leaching works, which are as fine and complete as any works of the kind in Nevada. The following is a copy of the Superintendent's letter of October 20: No. 1 level is now 331 ft in length, showing good ore 4 to 6 ft in thickness the whole distance. Each day's work south shows ledge widening, and better ore, some of it assaying into the hundreds. South tunnel winze and all stopes in Laity ground yielding splendid ore. The mill will start in 3 or 4 days.

Candelaria District.

NORTHERN BELLE.—*True Fissure*, Oct. 27: The drift from the main cross-cut has been extended 10 ft, and is showing small spots and streaks of sulphurets. The sulphurets assay as high as $60 per ton. Quite an important development has been made on the first intermediate shaft level, where, in crosscutting to the south, a body of chloride has been encountered which looks very promising, and is now showing an average width of 3 ft, assaying from $40 to $70 per ton. A bullion shipment amounting to $6,395.19 was made on the 23d instant.

COLUMBUS CON.—The 150-foot level has shown no change. A quantity of very good ore is being extracted from the old stope on this level. A streak of ore giving good assays has been encountered in the face of the drift, which is considered very encouraging. The amount of ore being broken in the mine is quite extensive, but only ten tons have been hoisted. The assays from this ore average $175 per ton, and as soon as the arrangements for handling it on the surface are completed, a larger amount will be brought up each day.

MOUNT DIABLO.—The drift below lower winze No. 2 shows a wide ledge of quartz that is mostly barren. The stope near the center of the mine, between the second and third levels, is furnishing considerable $70 ore. Some very good ore is being extracted from the east end of the stope, and the ledge looks well. A bullion shipment amounting to $11,244.60 was made on the 22d instant.

Eureka District.

SILVER CONNOR.—Eureka *Sentinel*, Oct. 28: In the Silver Connor mine, probably the largest body of ore ever found in Prospect Mountain is now being developed. Twenty-four mules are employed in packing the ore to the Eureka Con. furnaces. This body of ore was discovered on the 250-foot level of the mine, and it has been raised on up to the 200-level. The main body has been stoped out 20 ft of its width and 20 ft of its height. It has also been cut through 10 ft on one side and 7 on the other, and as yet, neither top, ends nor sides have been reached. The ore runs in value at the rate of $60 per ton, some of it going as high as $167 per ton.

Railroad District.

WARNER & CO.—Elks *Free Press*, Oct. 26: Since the starting of the furnace at Railroad, Warner & Co. have made the following shipments of bullion to the Bank of California: 1,419 bars of bullion weighing 140,052 pounds. To-day they will ship 218 bars of bullion weighing 21,640 pounds, and 170 sacks of matte weighing 17,000 pounds. The approximate value of the bullion and matte thus far turned out by the furnace is $36,000.

Tuscarora District.

INDEPENDENCE.—*Times-Review*, Oct. 25: Total length of drift north on the 300 level, 877 ft; progress during the week, 17 ft. No change to note, excepting that the flow of water has diminished to one-fourth of the usual amount. Have encountered one streak of very rich ore.

NAVAJO.—Cross-cuts, 650 level, have been extended east 61 ft and west 31 ft. Have started a power drill on this level to-day, and the cross-cuts will now be pushed ahead rapidly. The new pumps have been tested, and work satisfactorily. Have commenced hoisting ore to-day.

NORTH BELLE ISLE.—During the past week, work on the 300 level has been confined to timbering the drift, which has been completed. Expect to make the connection with Belle Isle within the next 10 days.

GRAND PRIZE.—West drift in the 400 level is in 95 ft. Have started an upraise to connect with the 300. Stopes in the 300 are producing good ore. Have commenced stoping above the 200 level.

ELKO CON.—Shaft No. 2 has been extended 11 ft during the week; total depth, 181 ft. The formation is heavily mineralized and carries small stringers of quartz.

ARIZONA.

MAMMOTH.—Prescott *Courier*, Oct. 23: This mine, which promises soon to outstrip the Comstock of Nevada, is in Silver Mountain district, 55 miles southwest of Prescott. The vast magnitude and richness of the Mammoth ledge, which consists of five locations, has been known for years, but little save assessment work has been done. Recently, the locators organized a company under the name of the Mammoth Silver Mining Co. In proportions the ledge is undoubtedly the largest mineral-bearing vein in the world. The exact length has never been ascertained, though it has been traced for a number of miles, and its width in many places is hundreds of feet.

UNITED VERDE.—At present there are 80 men at work in the mines and mill. The smelter has been in operation for about 60 days, during which time the value of the product, copper and silver, has been nearly $200,000.

DOSORIS.—*Miner*, Oct. 17: The shaft is down about 320 ft. The ore being taken out now averages from $1,000 to $1,500 per ton, and there is an immense body of it.

CONTENTION.—Tombstone *Epitaph*, Oct. 21: The foundation for the pumps is finally completed. The same is probably the heaviest and solidest piece of masonry ever erected in the territory. The material used is all cut granite. Some of the foundation rods are let in as far as 10 ft in solid mason-work. Rapid progress in putting the machinery in place is being made. There is no doubt that every thing will be ready for active service by the first of December.

COPPER QUEEN.—The Copper Queen, of Bisbee, has just declared another dividend of $125,000, and still the production is not falling off, and could very easily be largely increased.

COLORADO.

HUKILL.—Georgetown *Courier*, Oct 18: The Hukill mine, situated near Idaho Springs, was sold October 15th, at sheriff's sale. It was bid in by Mr. George McClelland, of the Idaho Springs Bank, for a sum over $5,000. Mr. McClelland in turn consummated a sale of this property to John W. Mackay, the Bonanza King of Virginia City, the purchasing price being $13,778.50.

SNOW DRIFT.—In the Thompson level, east of Good Hope Gulch, on the Snow Drift, a splendid body of rich ore has been cut. The pay streak measures from 12 to 14 inches of solid ore. A chunk weighing 162 pounds is on exhibition at Pollard's store; it mills 1,000 ounces silver per ton.

IDAHO.

BIG SMOKY.—Ketchum *Keystone*, Oct. 20: The Sarah, about 7 miles south of Vienna, has been developed by 4 miners since June 1st, and is now only awaiting cheaper transportation. A close estimate makes the expenditure in development work about $2,000, and the mineral in sight at least $10,000. Although not high-grade, the Sarah ore is abundant, and lies in one of the largest ledges in the country.

OPHIR.—The Ophir claim, on the headwaters of Boulder Creek, 20 miles north of Ketchum, is rapidly coming to the front. But little developed, it has already shipped 40 tons of fine carbonate and galena ores to the Philadelphia smelters, and the last lot of 9¼ tons sampled 200 ounces in silver, 1¾ ounces in gold, and 64 per cent lead. This property has been worked upon but 30 days.

VIENNA.—A big strike is reported in the Vienna mine. The Vienna bears surface indications of the greatest ledge yet discovered in the Sawtooth Mountains. Hundreds of tons lie on the surface over the Vienna Hill divide, at an elevation of 10,000 ft. The works are at an altitude of a little over 9,000 ft.

THE SMELTERS.—Ketchum *Keystone*, Oct. 17: The two 50-ton stacks at the Philadelphia smelters continue to run with success, and the bullion output is as usual. About 2,600 tons of bullion have been produced since the commencement of operations, and the total will probably be about 3,500 tons for the year.

IMPERIAL.—Milton Pinney is in from the Imperial mine, in Greenhorn Gulch, where he is working 15 first-class miners. He says that the greatest depth attained is 100 ft, but the vein is well defined and maintains its ore-bearing character throughout. It crops out for over a thousand feet. Over 300 sacks of ore, averaging 140 pounds weight, are on the dump, and the average daily yield is one ton.

STAR.—A miner who was in town from the Star mine a couple of days ago, stated that that property was looking better than ever, and that there were large reserves of ore in sight.

BONANZA.—*World*, Oct. 16: Wm. Hooton, from Bonanza, tells us a good clean-up was made from a crushing of Montana ore put through the Custer mill. A shaft is down on the Montana 350 ft. No stoping has ever been done. All the ore that has come from it was taken out in sinking the shaft. The mine continues to turn out high-grade ore. The Charles Dickens shows up splendidly. The arastra is running on ore from this, and a crushing is being put through the mill. A winze has been sunk 60 ft from the lower tunnel, through a 5-ft ledge with a 20-inch vein of high-grade ore. Pockets of wire and ribbon silver, carrying 30 per cent of gold, have been struck—almost the pure stuff—a little spar clinging to it. Assays of the tailings of the ore in the arastra run up to $80 per ton. There are 1,000 tons of ore on the dump. The Galatin Bros. and Jas. Hooper are at work in the Whale. The Custer Co. has worked out the Custer mine, and are now at work in the Unknown. The Unknown is on top of the hill, and the Custer slide, which yielded between $2,000,000 and $3,000,000, broke loose from this. Silver predominates in all the mines of the Yankee Fork or Bonanza country, the bullion assaying about 30 per cent in gold.

MONTANA.

LIQUIDATOR.—*Inter-Mountain*, Oct. 20: The Liquidator, after a long season of idleness, is now a regular producer of 100 tons daily of first, second and third class ore. Since July 1st $36,000 has been realized from the sale of crude ore on the dump—shipped to Swansea under contract. The amount previously realized from the sale of first-class ore only was $8,000. Under the new schedule of freight rates, 26 per cent ore, which a year ago would not pay to ship, pays a profit above all costs.

COLUSA.—*Inter-Mountain*, Oct. 18: The Colusa is now 400 ft deep. Several thousand feet of levels have been run. The ore product is 100 tons daily, and could be doubled by increasing the working force. Five matting furnaces and one blast furnace are in operation. The company is shipping 20 tons of matte and a large amount of crude ore every day, the total daily shipments being about 75 tons.

MOUNTAIN VIEW.—This is near the apex of the hill northeast of the Anaconda, and in the opinion of Mr. Larabie, it is crossed by what is incontestably the Anaeonda ledge. Throughout the enormous width of the ledge bunches and streaks of copper ore occur, as they did above the main copper deposits in the St. Lawrence and Anaeonda, leaving little doubt that at an increased depth the entire space between the walls will be filled with pay ore identical with that of the above.

SHONBAR.—Butte *Miner*, Oct. 17: The new machinery, boilers, and station pumps are now in running order. On the 300-foot level a large body of the rich ores found above has been struck. The same level is in about 30 ft easterly. The mine is looking better than ever before. There is a body of ore on the west, from the shaft to the west line of the claim, 220 ft, that has not been mined out.

WILLOW CREEK.—Cor. of Butte *Miner*: The new camp on Willow Creek, near Philippsburg, which is being opened up, is 12 miles from New Chicago, and the same distance from Clear Creek. These veins lie almost flat. The veins average 4 ft in width and sample 70 ounces in silver and $8 to $12 in gold. The Screamer lode is showing pay for a distance of 4,800 ft in length, the Copper Queen and Colusa showing pay the entire length of the locations, and the Yellow Jacket and Clear Grit the same. In several other locations there is 18 inches of ore that will sample 200 ounces, and the owners intend shipping this high-grade ore to Butte.

NEW MEXICO.

BLACK HAWK.—Silver City *Enterprise*, Oct. 19: Last Monday an immense and rich body of ore was opened at the bottom of the incline of the Black Hawk mine, at a depth of 250 ft. The ore is completely covered with the shining native silver and argentite. At a depth of 215 ft levels were run from this incline, and rich ore has been struck in them. It appears that the deeper they get the larger the pockets.

GOLDEN RULE.—The mill continues to run steadily, crushing from 50 to 60 tons per day. The mine is looking well. Ore maintains its usual grade. A station is being cut out for second level. Four to five tons of concentrations from the mill tailings are made every day. Over 60 men are employed at the mill and mine.

GRAPHIC.—In the Graphic mine, owned by Hudson and others, in Cook's Peak district, a rich body of high-grade ore was uncovered recently. The owners of claims in the neighborhood are jubilant. The assays give returns of about 200 ounces.

PEAK.—The Peak mine is being worked by C. Bennett and W. H. Kimball, and ore of a very high grade is being struck at every opening.

KINGSTON.—Deming *Tribune*, Oct. 18: The Kingston mines continue to improve. The Bullion yielded $20,000 last month from four car-loads of ore, and the shipments this month are of a yet higher grade. The Superior is also taking out very rich ore, and shipping steadily. The brick has been ordered for a smelter by the Iron King Co. The Lady Franklin is in rich ore; the Brush Heap continues to yield finely; the Little Jimmy has high-grade ore near the contact recently struck; and a new strike is also reported in the Illinois.

SLATE CREEK.—A strike was made on Slate Creek, 3 miles southwest of Telegraph district, in the Ednor mine, owned by Judge Corbin and Robert Swain, recently. Mr. Swain, upon presenting his partner with some of the ore, never dreamed that it contained wire silver in quantity, but upon being examined closely it was found to be marvelously rich. The claim is one of a group in the Carroll district.

OREGON.

NOTES.—Jacksonville *Times*, Oct. 19: Simmons & Co. are making good headway with their new enterprise in the vicinity of Waldo, and have quite a force engaged in opening a huge cut. Wimer & Sons, of Waldo, who are enlarging their ditch and renovating flumes preparatory to putting in another pipe, will soon resume operations. Klippel & Keaton are getting their claim ready for winter.

NUGGET.—Baker City *Democrat*, Oct. 17: On Saturday, while N. C. Haskell, of Auburn, was piping in the Marysville Co.'s mine in Ohio Gulch, near Auburn, he picked up a gold quartz specimen weighing 11¼ ounces, valued at $160. It is a beauty.

UTAH.

LULU.—Southern Utah *Times*, Oct. 20: It is stated, on good authority, that work upon the Lulu, the first south extension of the Horn Silver mine, will be resumed in a few days, and developments prosecuted on a businesslike basis. The is no reason in the world for lacking faith in the possibility of the Lulu folks striking the Horn Silver ledge, if they go down deep enough.

SILVER BELL.—*Tribune*, Oct. 18: This property, consisting of seven patented claims, has been developed by a shaft 385 ft deep, and a tunnel 1300 ft. The shaft was sunk from a point high up the mountain, and went through good ore all the way down, but to operate the mine from that point would be diffiault, because of the cost of hoisting to thes urface and then taking the ore down a steep hill. To obviate this and at the same time open up the other six claims, a tunnel has been run in a distance of 1300 ft, and a contract was let Saturday to extend this tunnel 1200 ft more, when it will be the largest tunnel in Utah. Up to this date there has been $80,000 expended on the property. At the foot of the shaft the vein is 55 ft wide, 6 ft of which is milling ore, running 54 ounces silver. There is on the dump over 3,000 tons of such ore, and the property promises to be one of the big bonanzas of Utah.

WASHINGTON.

THE NEW MINES.—Virginia *Enterprise*, Oct. 23: A letter from Heron Siding, 150 miles west of Missoula, to the *Missoulian*, contains the following: It is signed by D. M. Leamer. "There has been considerable excitement raised here in the past few days by the fact becoming known that the newly found gold fields of Cœur d'Alene were only 20 miles from here. Three men came in from Eagle City (the name of the new camp), making the trip in one day and a half, after wandering through the woods with but a confused idea of the route, getting lost several times, and having to retrace their course in consequence. They came out for supplies, and had the dust to buy it with; which, by the way, was the coarsest dust I ever saw. They report that there are in the neighborhood of 1,000 men there now. A pack trail will be cut at once. Contractors have agreed to do it in 20 days. Heretofore prospectors have been subjected to the hardship of having to go into the mines via Rathdrum, packing their supplies about 90 miles, having to cross the Cœur d'Alene, which can only be done after the 1st of August of each year, and at no time with any degree of safety."

The Distant Sierra.

[Written for the PRESS by J. W. A. WRIGHT.]

No quality of the air of California, and of the Pacific Coast generally, is more marked than its transparent clearness, especially during the greater part of winter and spring. In this regard our Pacific atmosphere quite equals the noted Italian skies. One result of this peculiar transparency is a wonderfully distinct view, at times, of our most distant mountain ranges, and the clear-cut outlines of the foothills. The distant view of the grand cone of Mt. Shasta, from many points in the Sacramento Valley, is a noted illustration of this fact. But it is neither boasting nor exaggeration to say that there is no part of California where so distinct and extended a view can be obtained, on our clearest days, of the snowy peaks, ridges and crests of

Our Higher Sierra,

As throughout Fresno and Tulare counties, particularly along the line of the railway, from Madera on the north to Tipton on the south. From the whole Mussel Slough district this entire view is peculiarly fine, for three reasons: 1. The regions around Hanford, Lemoore and Grangeville are a little south of west, or directly opposite the highest masses of the Sierra Nevada—the Mt. Whitney and Mt. Kaweah groups; 2. These grand mountain masses rise much more abruptly—from the Tulare and Fresno plains, and are nearer to them—than in any other part of California; 3. Mussel Slough, like Wild-flower, in Fresno County, lies so far west upon our broad plains that more of the snow-covered crests and peaks become visible than to an observer stationed nearer the foothills.

In the original sketch of the distant outlines of the Sierra herewith presented to readers of the PRESS, the artist has selected Hanford as a central point, noted for the superb view it offers of the snowy Sierras under a brilliant winter sky, when, so clear-cut are their contours, mountain masses and peaks from 60 to 80 miles distant in a straight line really appears not more than 10 or 15 miles from us. The view is from nature, and is true to nature. It is a wood-cut, from a pencil sketch by C. P. Cook, artist for W. W. Elliott & Co.* For vantage-ground, the sketch was made from the tower of the water-works, at a height of 40 feet from the surface, looking eastward. In the foreground it represents, faithfully, the tops of buildings and trees in Hanford, the level plains beyond dotted with ranches; then the dark-colored foothills; and, crowning the background of the broad and enchanting scene, comes the continuous line of the snow-capped ridges and towering peaks of the highest Sierra of California.

View from Hanford.

For convenience in representing so long an outline as 120 miles of our truly magnificent mountain range, the sketch is divided into three parts. No. 1, above, begins on the left, at a point nearly north of Hanford, and No. 3, below, ends on the right at a point a little south of east from Hanford. A close study of this very grand and impressive scenery of nature for several years, among its splendid peaks, and as seen from our broad plains, aided by every possible source of information, including conferences with such mountaineers as Mr. Frank Dusy, Prof. Gustav Eisen, and Judge W. B. Wallace, has enabled the writer to fix with certainty most of the localities and peaks named with the engraving.

Looking slightly north of east from Hanford or vicinity, any clear winter day, one sees, through a deep notch or gorge in the foothills, two huge white cone-shaped mountain masses. The larger and higher one is to the left, and is undoubtedly

Mount Lyell,

Named after Sir Charles Lyell, the eminent English geologist. That to the right is Mt. Ritter, named in honor of the noted German geographer Carl Ritter. The depression through which they are seen is the canyon through which the San Joaquin enters our plains near Millerton. Mt. Lyell is interesting as a landmark, for there the county lines of Fresno, Merced and Mono meet. It is interesting as a river-source, the main San Joaquin and its north fork having their extreme sources on its eastern and southern slopes, while the Merced rises on its northern and western sides. It is interesting for its living glaciers, discovered there by John Muir at least ten years ago. And, by the way, the living glaciers announced as discovered recently by an explorer west of Mono Lake, are most likely those well known glaciers of Mt. Lyell, for these are just west of Mono Lake. The white peaks and ridges, some ten miles west or to the left of Mt. Lyell, are the elevations around Yosemite Valley. Mt. Lyell is 13,327 feet high, and is about 95 miles in a direct line from Hanford.

The eye, following the long, white crest to the southward, and passing over a number of minor peaks, comes to a high, sharp, regular cone, very conspicuous in its locality. This is

Mount Goddard,

Named after a civil engineer and mountain surveyor. From its northeastern slopes the south fork of the San Joaquin takes its rise, and on its south side numerous lakes form the sources of the middle fork of King's River. This handsome peak is No. 4 in the sketch. Its height is fully 14,000 feet.

Next, the letter "A" marks the location of Paradise Valley, or the canyon of the south fork of King's River, described by our mountain explorers as a "second Yosemite." No. 5 marks a handsome "saw-tooth," named after Prof. Silliman. It is 11,625 feet high, and is on the great western divide of the Sierra Nevada. Between this and a long, flat, table mountain, three high peaks are seen. These are the only ones marked in the engraving of which identification from our plains is at all uncertain. But that to the left, or north, is most likely Mt. Brewer, 13,886 feet high; the second, Mt. Williamson, about 14,400 feet; and Mt. Tyndal, 14,386 feet. These are numbered 6, 7, and 8. They were named after distinguished scientists, by Prof. Whitney's geological survey party, in 1864. The long, flat mountain immediately south of these is called on some of our older maps Table Mountain; but as there is a Table Mountain in Tuolumne County, and another near Millerton, a more distinguishing name for this mountain was needed. Hence, it was named Mt. Hazen, in honor of General Hazen, Chief Signal Officer, by Capt. Michaelis, the United States officer in command of the Signal Service and scientific expedition to Mt. Whitney, in August and September, 1881.

The second peak southward from Mt. Hazen is Milestone Mountain, long known in this valley by the tall granite obelisk surmounting it. It is also called "The Old Man." On a very clear day this obelisk can be distinguished by the naked eye, but it is more readily seen with a good glass. Immediately to the right and left of Milestone Mountain, and about equidistant from it, are two prominent peaks. The one north was named, in 1881, Mt. Michaelis; the one south, Mt. Langley, after the commander and scientist of the expedition above named. These names, with a number of others, were given from the summit of Mt. Whitney, on the morning of September 6th, 1881, when the writer, with his friends, Judge W. B. Wallace of Visalia, and Rev. F. H. Wales of Tulare City, enjoyed the treat of being in that grand region with the government expedition, whose work was then described in the PRESS and other journals.

No. 10 is Mt. Michaelis, and No. 12 Mt. Langley. We have now reached that part of our vast mountain range which presents in winter far the grandest view to be had from our plains of any portion of the Sierra Nevada. The artist has so well represented this part of the view that it will be readily recognized by any who have seen it. Through a deep depression in the foothills this most Arctic-looking region of the Sierras shows most conspicuously; the great mountain masses, their ridges, cañons, seams, crests, and sharp-cut peaks, covered with virgin snow, and glittering in the sunshine.



THE SIERRAS AS SEEN FROM HANFORD, TULARE COUNTY; 120 MILES IN THREE SECTIONS.

1. Yosemite. 2. Mt. Lyell. 3. Mt. Ritter. 4. Mt. Goddard. 5. Mt. Silliman. 6. Mt. Brewer. 7. Mt. Tyndall. 8. Mt. Williamson. 9. Mt. Hazen. 10. Mt. Michaelis. 11. Milestone Mountain. 12. Mt. Langley. 13. Location of Mt. Whitney. 14. Mt. Abert. 15. Mt. Henry. 16. Mt. Le Conte. 17. Mt. Kaweah. 18. Empire Mountain. 19. Miners' Peak. 20. Mt. Garfield. 21. Bullion Peak. A. Location of Paradise Valley. B. Location of Kern Canyon.

The better to understand this portion of the Sierra Nevada, we must remember that from King's River Canyon, southward, for 60 miles or more, there are two great divides, or back-bones,—the western, on which are Mts. Silliman, Hazen, Milestone, and all from No. 14 to 21; and the eastern, on which are Mts. Kearsarge, at Kearsarge Pass, near Independence (not marked here), Mts. Tyndall, Williamson and Whitney. The latter divide is from 10 to 12 miles east of the former, and is the grand and precipitous western wall of Owen's River valley. From the neighborhood of Mt. Hazen is a lofty transverse wall running nearly due east to Mt. Williamson. This wall is the almost impassable divide between the headwaters of the south and middle forks of King's River, north of it, and the Kern and its tributaries south of it.

Mount Whitney,

The highest and grandest of some half dozen comparatively isolated peaks, lies fully eight miles south of this dividing ridge, between King's and Kern rivers, and the only river that is fed by its melting snows, from its northern, western, or southern sides, is the Kern, merely a few insignificant streams flowing from its eastern face into Owen's River. Its position is marked, as nearly as can be, in the engraving, at No. 13. It so happens that the highest peaks in the western divide (the Kaweah Buttes) come directly between us and the Mt. Whitney group, so that Mt. Whitney is perhaps not visible from any part of Tulare County, unless it be from its most westerly portions, where we may, so to speak, overlook the high peaks intervening. It is true, however, that from Fresno City and vicinity a distant group of peaks in the great eastern divide is readily seen with a good glass, especially from the Court-house dome, one of which has the noted helmet-shape of Mt. Whitney, and other marks, that make it quite certain that we can see Mt. Whitney from there, looking through the deep gorge of King's River. It assuredly has much the same appearance that Mt. Whitney presented to our party of three in the summer of 1881, after we became familiar with it, and saw it and its attendant peaks, Mts. Young, Hitchcock, Guyot, and Agassiz, day after day, as we moved with our pack animals northwest and west across the huge table-lands and ridges of the Kern and Kaweah rivers. It is also a fact worthy of record here, that, looking westward from the towering summit of Mt. Whitney, all the peaks and crests from Mt. Brewer (No. 6) to Bullion Peak (No. 21) presented very much the same outline against the western horizon as does this magnificent mountain profile present in reverse on the eastern horizon, when we look eastward from the plains of Tulare County. It is for this reason that we can so readily identify the several peaks named in 1881 and previously, as they appear in the original engraving herewith presented—the first attempt of the kind to represent with any accuracy an extended profile of our truly grand Sierra Nevada. We next come to

The Kaweah Buttes,

A peculiarly isolated, distinct group of peaks—the culminating peaks of the great western divide already mentioned. These were first explored, and their locality and surroundings accurately fixed by our party of three, in '81. Some half dozen of these sharp, high, precipitous peaks, evidently from a later and more direct volcanic action than the Whitney group, rise abruptly to altitudes 4,000 feet and more, from the extensive pine-clad table-land between Kern Canyon, on the main Kern, and Jenny Lind Canyon, through which flows Crahtree Creek, one of the chief tributaries of the Kern. Mt. Kaweah, No. 17, was the only one of these fine peaks named before our party visited them. This we ascended September 16th, and built a monument on its summit, which we found to be at least 14,000 feet above sea level. Just as Mt. Whitney had been first named by Clarence King, from the summit of Mt. Brewer, on the Fourth of July, 1864, so we by common agreement named the three high peaks in the group just northwest of Mt. Kaweah, from north to south, Mts. Abert, Henry, and Le Conte. The first, from Col. John J. Abert, who for thirty years or more was chief of the Topographical Engineers, U. S. A., and who fitted out the Fremont expedition, that first opened up California to American enterprise; the second, for Prof. Joseph Henry, who was so long the honored Secretary of the Smithsonian Institute at Washington; the third, or Prof. Joseph Le Conte, of our State University, who has done so much for the geology of California. These are numbered 14, 15 and 16, in the engraving, and are each 14,000 feet in height or upwards.

These magnificent peaks form the most conspicuous landmarks of our Sierra Nevada, as seen from the plains of Tulare and Fresno counties.

Next come 18, 19 and 20—Empire Mountain, Miners' Peak, and

Mount Garfield.

These belong to the Mineral King District, which was for some years the chief mining district of Tulare County, and is situated about eighty miles, by road, slightly north of east, from Hanford. Its wide metal-bearing ledges abound in silver, combined with lead, zinc, copper, and antimony.

The noted Empire mine of Hon. Thomas Fowler is in the western face of this Empire Mountain, the mouth of its great cave and tunnel being about 10,000 feet above the sea. At the base of this mountain the little mining town of Mineral King nestles cosily, at an altitude of nearly 8,000 feet. Nineteen and twenty appear as two great saw-teeth. The one to the left is Miners' Peak, also called by the miners "Half-Potato Hill." That to the right is Mt. Garfield, named under the following circumstances: September 21, 1881, the day after our party returned from exploring the upper Kern, Mr. Wales, Joseph Palmer, Mr. Lavelle, and others of us, made the ascent of Miners' Peak, which lies about four miles east of the town of Mineral King. While on its summit, we learned, by careful leveling, that the fine unnamed peak some four miles southeast of us was several hundred feet higher than Miners' Peak, which till then had been sup-

(CONCLUDED ON PAGE 292.)

* The engraving used herewith is from the publication entitled "Guide to the Scenery about Mt. Whitney," by W. W. Elliott & Co., 421 Montgomery St., S. F.

THE ENGINEER.

Shipbuilding Now and Then.

Shipbuilding in some of its chief characteristics is a very different art from what it was only a few years ago. The substitution, first, of iron for wood, and, secondarily, of steel for both wood and iron, will soon have effected an entire revolution. Canada, next after Maine, was the stronghold of wooden shipbuilding, but a feeling bordering on consternation has been caused in the Dominion by the announcement that a firm who for many years have been among the largest owners of sailing ships in America, building most of their vessels in St. John and vicinity, have just closed a contract in England for a sailing ship of 1,500 tons, to be built of iron. Wooden shipbuilding in Canada for several years has been a declining industry, and this last movement is regarded as a presage of its well nigh final extinction. The so-called "soft-wood" ships of the Canadian Provinces were the cheapest that could be built, it being possible to put afloat in New Brunswick or Nova Scotia a vessel of this description fully equal in appearance to one built in Maine, and at a cost several dollars less per ton. If, under such favoring conditions, wood can not compete with iron or steel, Canada has but one alternative, if she would maintain her shipyards, of seeking materials among the products of the mine rather than of the forest. In this new departure builders in the United States have already got the start, and by a long distance. On the Delaware River, convenient to the iron and coal mines of Pennsylvania, no less than 56 vessels have been constructed during the present year, five of them wholly of steel, and the indications are still more promising for the year 1884. It is claimed that the progress made in the Delaware yards since January 1st, is equal to theentire business done in the same establishments in the whole of 1882.—*The Iron Age.*

To be Pushed in Earnest.

If the latest news reported from the Isthmus of Panama may be relied upon, there would appear to be good grounds for anticipating the finishing of the ship canal that shall unite the two oceans at some reasonably early date. Hitherto, from all that could be learned from that region, very little real work had been done, and the opinion was gaining ground that the obstacles interposed by nature in the deadly climate, in addition to the engineering difficulties to be overcome, had proved so great that the projectors of the canal were simply going through the motions of keeping at work, waiting, meantime, for the first good opportunity to give it up without incurring too serious a loss of prestige.

From present indications, however, the projectors of the canal have no idea of abandoning the work. Ten thousand workmen are said to be distributed over nine sections of the route, covering thirty miles of distance. These workmen are composed principally of native Jamaicans, who, being thoroughly acclimated, may be expected to do some effective work in pushing the canal to completion. From whatever aspect this important enterprise is viewed, the enormous benefits that will accrue to the commerce of the entire civilized world from its completion must be admitted; and no one intelligent enough to comprehend this fact will wish the present undertaking any thing else than ultimate and speedy success.

DEEP-SEA LIGHT-HOUSES.—An English journal gives an account of a plan recently proposed by an English engineer for founding "deep-sea light-houses." As explained to the London Society of Engineers, this plan proposes the construction of a hollow cylinder of riveted iron-work 290 feet long, to consist of two sections, the upper part to be 140 feet long, destined to rear its head above the waves, and fitted as an ordinary light-house, while the remaining portion of the tube is to be ballasted so as to sink below the water-line and counteract the force of wind and waves on the exposed part. The whole apparatus is to be anchored in deep water, by heavy steel cables. The inventor claims that it would be easy to tow such a structure to the spot selected for it; and then, by admitting water to the lower section, it would assume an upright position and ride the waves like a bottle. The practical use which this is intended to serve is to give notice of approaching storms by means of telegraphic connection with the shore. It is believed to be practical to found a floating telegraph station, say 1,000 miles from the coast of England, in mid-ocean, from which comings of approaching storms could be given long before their arrival.

THE PENNSYLVANIA RAILROAD is now building a gigantic inclined plane at Pittsburg, up which teams and freight and passenger cars will be hauled by means of steel cables. The plane has a total length of 840 feet, the rise being nearly 43 feet in the hundred. It is built on arches. The longest span is 232 feet, another one is 120 feet, and the rest 60 feet each. The cables to be used in hauling up cars are entirely of steel, and will be the largest steel cables ever made in this country. The engines which will furnish the motive power are nearly completed, and will be of 700 indicated horse-power. The total cost of the gigantic structure, complete, will be $275,000.

USEFUL INFORMATION.

Chicago Beer.

The *Northwestern Lumberman* claims that until lately beer has never been supposed to have any very intimate connection with the lumber business, except it adds as an internal fuel to fire the ardor of a lot of dock-wallopers, or to induce a lot of men to hustle up a drive. Now it is asserted that beer is made of which hemlock bark is a principal ingredient, though it never has had much of a reputation beyond the modesty of a plain tea. The cargo arrivals of hemlock bark at Chicago are numerous, and it is stated by persons who claim to understand the ropes, that the tanneries are not the only importunate consumers, but that the bark is extensively ground and sold to makers of beer at outside points.

It is used as an adulteration for beer. Large quantities of it are ground up and shipped to other points. Brewers do not report the ingredients of which their beer is made, as they once did. The courts have decided that they are not compelled to do so. Tanbark and soda are the principal substances used. A little rice malt gives it body and makes it hold foam. Hemlock bark is a new discovery in this respect, and is useful because it takes the place, to a certain extent, of both malt and hops. It is not poisonous, but it certainly can not be said to contain any nourishment. It adds the pungent, bitter taste, and gives the dark-reddish color to the liquid. It is very cheap, and the brewers who use it must grow rich very fast.

ORANGE AND LEMON BOXES.—It is generally supposed, says the New York *Maritime Register*, that the boxes in which oranges and lemons are sent to this country from the Mediterranean are made along the shores of that sea. This was the case years ago, but it is so no longer. Formerly the shooks were hewed out of the log by hand in Italy, and sent down to the packers. But a few years ago Capt. T. J. Stewart, a native of Maine, a shipmaster who had traded with the Italian ports, came to the conclusion that these shooks could be made much cheaper in his native state, and shipped thence to the fruit districts at a profit. With him to think was to act. He accordingly retired from the sea and proceeded to Bangor, Maine, where he put his new idea into practice. It has proved highly successful, and now orange and lemon boxes are exported thence to many of our fruit-shipping ports; also to all the great ports of the Mediterranean fruit districts. The trade has grown to important proportions, and it is said that few oranges and lemons arrive in this country that are not in boxes of Maine make.

WHAT IS ROSEWOOD?—It has been a mystery to some people why the dark wood so highly prized for furniture should be called "rose-wood." Its color certainly does not look much like a rose, so we must look for some other reason. An exchange explains that when the tree is first cut the fresh wood possesses a very strong, rose-like fragrance, hence the name. There are a half dozen or more kinds of rose-wood trees. The varieties are found in South America and in the East Indies and neighboring islands. Sometimes the trees grow so large that planks four feet broad and ten feet in length can be cut from them. These broad planks are principally used to make the tops of piano-fortes. When growing in the forest the tree is remarkable for its beauty, but such is its value in manufacturing as an ornamental wood, that some of the forests where it once grew abundantly now have scarcely a single specimen.

LARGE FLOUR PACKAGES.—The practice in England is to send out flour in packages containing 285 lbs. These packages are very difficult to handle. Recently, a man attempting to carry one of these bags fell under the excessive weight, and broke his back. It is contended by the men that in addition to their safety being endangered in this way, they are rendered prematurely old by the constant carrying of such heavy weight. It was decided to request the mill owners in future to make the bag two centals or two hundred pounds, and the first important movement in England towards uniformity in flour packages was begun in Exeter, September 22d, when a meeting of flour millers of that place and vicinity was held to act in the matter.

STEAM WHISTLES.—To appease the great outcry which is now being raised against the steam whistle nuisance, the *Railroad Gazette* suggests the substitution of a steam horn. That journal says, that as a general rule the steam whistle would be very powerful to be effective within half a mile. If a horn were used the gain in useful effect would be very great, while the disagreeableness of the tone would be almost entirely done away with. The form of such an instrument might be very simple and much less expensive than the whistle. The tone would be mellowing—much like the sound of the modern tuba or cornet. There seems to be here a good opportunity for some ingenious person to exercise his inventive talents.

A SEA GRASS FOR BREAD.—On the west coast of England grows a sort of sea grass (*porphyra laciniata*) which is made into something very like bread. In the main it is gathered by women; they then wash it and pluck all other plants carefully from it. After this it is boiled for some two hours; then the mass is cut in pieces with knives and kneaded into loaves. Oat meal is then strewed over it to give it greater cohesion and a more inviting appearance, and then it is baked. It keeps in summer for four days, and in winter for eight. Many women on the coast of Devonshire earn their living by selling this bread, and most of it is sent to Swansea (in Wales), where it is much liked by the poorer classes.

THE MIXING OF WHEATS of various sorts for the purpose of producing different brands of flour has attained great perfection in England, and has caused the peculiarities of the different wheats to be closely studied. As to the wheats of the Russian provinces, although they are certainly quite strong, yet unmixed with other wheats they are too weak for really good flour. The Konigsberg, Odessa, and Black Sea flours have a decided tinge of color, but are less strong than the others. There are no wheats from any portion of the world as good for mixing as the best California varieties.

THE FUTURE OF TEXAS.—General McClellan, who has recently visited many parts of the Texas Panhandle, predicts that by the year 1890 the state will have a population of 5,000,000, while he also affirms that it can support 20,000,000 without overcrowding. The capabilities of Texas are only just being discovered: it is larger than France, with a better soil and an equal climate, is well watered, and is being completely intersected by railroads.

CARRIER RAVENS.—Successful experiments have lately been made at Coblentz in the training of ravens as carrier birds in place of pigeons. The latter are more subject to the attack of birds of prey than ravens. The trained ravens were made to fly a distance of forty miles, and their performances gave much satisfaction.

GIANTS IN PATAGONIA.—A party of Italian scientists have just returned from an expedition to the South Pacific, having proved to their own satisfaction that a race of giants once existed in Patagonia. In wandering over Terra del Fuego, they found human bones of marvelously large size.

CYPRESS VS. WHITE PINE.—A gentleman who has charge of an extensive sash, door and blind factory at Vicksburg, Miss., says that for these articles cypress is superior to the best white pine.

GOOD HEALTH.

A Chapter on Health Foods.

The day is cold, and dark, and dreary indeed, when one does not find in an exchange a fresh theory upon the proper kind of food for human consumption, together with authoritative directions for proper preparation. The amount of unadulterated ignorance and superlative gall displayed by some of these writers would be more startling to the careful reader were he competent to pronounce judgment with certainty, but the fact is that the world moves so slowly in the matters of cookery and medicine, that there is to-day no one authority on either whose words are believed by a very large constituency.

One crank will tell you that bread made from white flour is like so much lead in the stomach, and should be discarded entirely, the coarse meals, rye, corn, and oat, being used in place of it. Another will enlarge on the value of mush, gruel, and porridge, from oatmeal, rye, or corn meal, and will prove to his own satisfaction that mush is the only fit food, in connection with fresh fruit, for the human stomach. Then comes the oracle who says that mush is not even fit for animals, and is poison to the human race. He tells you to eat fermented bread only after it has been baked two days, and says that rye and oat meal stirred up in water and baked in thin layers, make the only bread fit for eating. He tells you that meat is very bad for you, particularly in summer, but if you will eat it, confine yourself to certain kinds cooked in a certain way.

The soft-brained vegetarian hops into the ring with his war cry of "down with meat food," and tells you that rice, sago, tapioca, vegetables and fruit are the proper foods, and the only ones that insure perfect health and long life. To him all flesh is poison—fish, fowl or beast. Like his predecessors, he has winter and summer diets, and rules for cooking. The meat man comes along with his forcible demonstrations that meat and wheat bread in winter, and fish in summer, with a select list of vegetables, constitute the only truly healthful list of regular tri-daily visitants to the stomachs of the people.

There are various side issues, such as milk foods, causes of nervousness, rare or burned meats, boiling, baking, frying, broiling, steaming, etc., which enter into all these arguments to some extent, and the careful student of these often well woven and always wonderfully formed theories of diet is at last driven to the desperate course adopted by the man who believed every thing he read, and cut off, one by one, each separate article of food and drink, until he reached a point where water and dried pea flour were the only things he consumed. He read an analysis of water, which proved it to be full of disease germs and poisonous animalcules, and learned from another source that pease contained so much starch that any preparation thereof consumed for a certain time would turn the stomach into a mere laundry attachment. This capped the climax, and the weary seeker after a healthful diet burned the scrap book which he had filled with dietetic theories, and lived thereafter upon every thing which pleased his palate, regardless of the consequences.

While it is true that some people thrive upon food that would sicken others, and quite as true that certain breads are unwholesome, certain meats harmful, and certain modes of cookery sure to render the food indigestible, the sensible portion of the world's inhabitants have come to the conclusion that the correct way to feed is with such foods as are most desired by the individual. All feel, at times, the desire for a change of diet, and there are few who can not secure this at will. Certain very palatable dishes are undoubtedly very unwholesome, but there is no master so arbitrary and imperious as the human stomach; and so long as there is a world with people in it this must remain a fixed fact, so that until the millenium arrives people will eat what they please, as they please, food theorists and dietetic cranks to the contrary, notwithstanding.—*Exchange.*

UNNECESSARY NOISES are attracting the attention of medical men and journals. The *Medical News* says: "To sick and convalescent, and to 'nervous people,'—a class rapidly increasing in number with the progress of our civilization—street noise is an intolerable nuisance, which, in some cases, may result in positive injury, and is a penalty paid for living in the city. Many of these noises are, in a degree, the necessary concomitants of traffic and manufacture, and therefore the result of useful occupation; others are inheritances from the bygone, and have long since survived the period of their utility. Of the latter we may mention, as conspicuous examples, the church bell and the factory whistle, both of which have been entirely superseded in their useful purpose ever since the introduction of watches into general use. The unnecessary noises—and they are legion—should go.

GLUTEN.—Through chemical research it has become established that pure gluten is not digestible in the human economy, and that it attains its greatest nourishing properties when mixed with other nutritive substances. It becomes most easily digestible when mixed with albuminous portions of vegetables. The substance which is obtained by washing the dough of wheat flour is, in fact, such a mixture as, being dissolved in alcohol, can be separated into its several elements, while at the same time the gluten contained therein is not dissolved. Pure gluten is perfectly yellow, tastes like balsam, and has a peculiar odor. It is very tenacious and elastic, and is not soluble in cold water. It contains from fourteen to sixteen per cent of nitrogen. Nothing among vegetable substances, except albumen, contains it in so large a quantity.—*Allgemeine Muehler.*

HYGIENE OF MOUNTAIN CLIMBING.—Dr. Brenner advocates exercise in the high, fine air of mountains as the best protection against the diseases contracted in city life. The characteristics of the mountain climate are the low temperature and air pressure; the low relative humidity; the high per cent of ozone; the strong light and insolation; the freedom from dust and bacteria. All these act well on the bodily health. The lungs work with greater strength, the heart beats faster, the blood circulates more quickly, appetite is increased, perspiration becomes freer, the muscles become more energetic, and the whole body gains in strength and endurance.

TEMPERATURE OF A BATH.—The temperature for a bath is the one which feels agreeable and comfortable, and not the one that feels hot or cold. Of course these may be necessary in certain cases. As a rule a bath may last as long as it is agreeable. This may be one minute, five minutes, or longer. Those who have accustomed themselves to hot baths may lower the temperature gradually and soon accustom themselves to a cold or cool bath.—*Herald of Health.*

CONSUMPTION OF QUININE.—Quinine is said to be decreasing in demand at the West, a prominent Chicago firm reporting that weekly sales are a fifth of those a few years ago; a circumstance due to the disappearance of malaria as farms are drained and land cultivated. Malaria is certainly increasing in New England. *Boston Traveler.*

CONSUMPTION AN INFECTIOUS DISEASE.—The Wisconsin State Medical Society, during its recent annual session, passed a resolution virtually declaring consumption to be an infectious disease, and urging the necessity of the proper isolation and disinfection of those suffering from it.

M. VICTOR SAINT PAUL has placed $5,000 at the disposal of the Paris Academy of Medicine, as a prize to any person, whatever may be his vocation or nationality, who shall succeed in discovering an infallible means of curing diphtheria,

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SAN FRANCISCO:

Saturday Morning, Nov. 3, 1883.

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Passing Events.

The proposition to organize a manufacturers' association in this city, to which we refer elsewhere, is something novel for this Coast. A meeting has been held, and arrangements to perfect the organization are being made by a committee.

Very little news of special importance comes from the mines just at present. Work is being vigoriously prosecuted and preparations for winter being made.

Advices from Mexico with respect to the yellow fever show that the disease was by no means confined to the coast alone. The existence of this dread disease in the region referred to will have more or less influence in the prosecution of mining entsrprises. A vessel from the Mexican ports, with three cases of yellow fever aboard, came into this harbor during the week, and is now in quarantine.

THE following are among those receiving prizes at the International Fish Show, at London: The Cutting Packing Company, San Francisco, for general exhibit of prepared fish; the Oregon Packing Company, Portland, Or., for general exhibit of canned fish; J. O. Megler & Co., Brookfield, W. T., for salmon in cans; Alaska Commercial Company, San Francisco, for collection of sealskins.

Look Nearer Home.

It does not follow because there are a number of districts in California and Nevada that are only worked in a small way, or not worked at all, that these regions are worthless, or should not be prospected. It very often happens that a district gets a "black eye" by being overrated at first. Then, again, a few capitalists get disappointed, and give it a bad name, so others will not touch it. A more common reason is, that the ore may be of such a character as to require very expensive machinery to beneficiate it, or be of so low a grade as to pay only moderately. Another thing, too, attention may be attracted from a place by others more promising at the time, and then people do not go back to the first one.

It is a very common experience for men to prefer going a long distance to mine rather than open claims near home. "The hills look green afar off." A well worded description of a mine in Arizona, Mexico, Idaho or Alaska, will seem more tempting to a California or Nevada prospector than the sight of a promising ledge in his own state. Two or three failures in a camp will often injure it beyond recovery, when it may have been more the fault of the men than the mines. In fact, the fault of the men is too often laid to the mines.

There are many places in this state which were abandoned twenty years ago where mines are now being profitably worked, under the changed conditions. No doubt in a few years more there will be many other mining claims now thought of no value that will be worked. Nearly every old miner can tell of claims which would be profitable if properly opened. Development companies, such as we described a few weeks since, will do much to bring forward mines of this kind. For men with experience and means, there are hundreds of places on this Coast where money can be made in mining, without the necessity of going hundreds of miles away from the metropolis.

A Manufacturers' Association.

A preliminary meeting of the manufactnrers of this city was held a few days since to arrange for a permanent organization. Among those who signed the call for the meeting were the following:

Tubbs & Co., of the Potrero Rope-walk; William Harney, Secretary of the Golden Gate Woolen Mills; Hinckley, Spiers & Hayes, of the Fulton Iron Works; the California Wire Works; Kohler & Frohling, wine makers; W. T. Garratt & Co., brass founders; the Pacific Saw Company, the San Francisco Tool Works, Abner Doble, Irving M. Scott, Savage & Son, Arpad Haraszthy, vintner; Whittier, Fuller & Co., S. T. Taylor, paper manufacturer; Buckingham & Hecht, shoe manufacturers; Armes & Dallam, makers of wooden-ware; L & E. Emanuel, furniture manufacturers, and the California Sugar Refinery.

Messrs. Hallidie, Scott, Kerr, Jackson, Garratt, Savage, Haraszthy, Harney, Boesch, Taylor and Kohler were present. A committee on organization was appointed, consisting of Messrs. Hallidie, Whittier, Haraszthy, Harney and Garratt.

The proposed organization is in the interests of home producers and local manufactnrers. Mutual protection of common interests is the object. The committee will report in about two weeks, when more will be made public concerning the organization.

THE STATE MINING BUREAU has been enriched by the donation of an excelleut portrait of Dr. J. B. Trask, the first State Geologist of California. Mr. P. L. Peters, the artist, has presented a finely executed portrait in oil of the late Joseph Wasson, who may be called the founder of the State Mining Bureau, as it was mainly by his efforts that the institution came into existence. Both these pictures are of great historical interest.

IT has been remarked that the interior of the state shows this year a marked progress in development. Large amounts of real estate have changed hands, and a large immigration has taken place. Sacramento feels this new life, and more improvements have been made there during the present season than for years past. Three new blocks are being erected, which will be the most costly in the city.

IT is rumored that King Louis of Portugal, being weary of the liberal agitation in his kingdom, thinks of abdicating.

New Ore Grinder and Amalgamator.

A new form of combined ore grinder and amalgamator has just been patented through the MINING AND SCIENTIFIC PRESS, by Peter Eddy, of Nevada City, Cal., who has assigned an interest in the patent to James G. Hartwell, of the same place. The apparatus is intended principally to render profitable the further reduction of quartz-mill tailings known to contain free gold, but classed as too low a grade to be worked with the ordinary apparatus now in use.

An exterior cylindrical case is supported on suitable framework, and placed with its axis horizontal, the pulp or tailings being fed in through a hopper. A shaft passes through the cylindrical case, and at one end is a cylindrical shell, inside the] other, nearly equal in diameter to the drum. This inner shell is supported on the shaft, and has inwardly-turned flanges. This shell is made in sections, and may have interior plates or dies, made removable. Within this shell is a receiver, of smaller diameter, which serves to receive the material from supply pipes, and from which it is conveyed to the grinding shoe, through a radial plate which extends outwardly from its periphery, and telescopes into a similar pipe, which projects inwardly from the shoe. This shoe is a heavy iron arc of the same curve as the interior of the shell, and it rests on the inside bottom of the inner cylindrical shell. As the receiver turns loosely on the shaft, and as the shell is caused to rotate by the rotation of the shaft to which it is fixed, the shoe slides around loosely within it, on account of the tendency of gravitation to keep it at the bottom. The material is ground beneath the shoe as the shell revolves, while the shoe, as stated, remains comparatively stationary at the lowest point.

After the separated pulp has passed under the shoe and been ground, a further separation will take place. The lighter material is floated over a flange, by the water, while the heavier material is carried by the rotation of the shell upward and around the die, to where it comes in contact with the scraper, which directs it to a quicksilver tank.

Spirals or screw-shaped flanges are supported from the axle or shaft, which have an exterior diameter about equal to that of the shell, and as these are revolved they carry the material over and through the mercury, so that any gold contained therein may be amalgamated and saved. The action of the spiral flange causes a slight wave or movement of the mercury in the direction of the discharge, and to counteract this the end of the spiral flange is formed so as to prevent the mercury passing out.

A series of arms is secured to the shaft, and have buckets fixed on them so as to dip into that portion of the case at the opposite end from the grinding dies in the shell. These buckets discharge into suitable pipes connecting them with the receiver. The heavy sand is thus carried into the receiver, and then under the shoe to be ground; after which it is again carried by the spiral flanges over the mercury trough and into the space where the buckets work.

When the pulp or material first enters the case through the hopper it is stirred up by the spiral flanges and by paddles fixed to them, and an action takes place which allows the heavier valuable portions to settle to the bottom, where they come in contact with the mercury, which is kept in motion, so that any free gold will be amalgamated, while the slimes and light waste are kept in constant agitation and are carried off. A discharge trap allows the mercury to be drawn off when desired.

HOLLOW MAGNETS.—While Preece has found that there is no difference in the conducting power of the lightning rods of various forms, Holtz has concluded that solid steel bars do not form so good permanent magnets as tubes, because the core acts as an armature joining the two poles. In experimenting to test his hypothesis, he magnetized rods and tubes to saturation, and found that the magnetism of the tube showed an excess of more than fifty per cent. After waiting six months he subjected the same magnets to new tests, in order to find which retained the magnetism best. He found that the magnetism of the solid was to that of the hollow magnets, in one case, as 1:2.5, in another, as 1:2.9.—*Wied. Annalen.*

A HUNTER at Cucamongo, San Bernardino, has shot one thousand dozen quail this summer.

Precipitation of Gold.

[Written for the PRESS, by C. H. Aaron.]

In the paper by W. Rothwell on the "Treatment of Auriferous Concentrates" at the Deloro Works, it appears that a difficulty was encountered in the precipitation of the gold in the usual manner by iron sulphates, which led to the use of charcoal for that purpose. Mr. Rothwell mentions that sulphuretted hydrogen has been suggested, and seems rather inclined to favor its use.

In my book on "Leaching Gold and Silver Ores," I have mentioned the use of hydrogen sulphide as a precipitant for gold in solution as terchloride, with the remark that copper, if present, would also be precipitated, which would be an objection to that method; but since the book was written I have found that the difficulty may be easily overcome. At the Plumas National Chlorination Works, in Plumas County, California, I found that the gold was precipitated in a very unsatisfactory manner by iron sulphate. The concentrates contained a large quantity of magnesia, which necessitated the addition of salt in the roasting. The gold, as thrown down by iron sulphate, was a black, slimy mud, difficult to collect, almost impossible to wash, and troublesome to melt.

I then made hydrogen sulphide from iron sulphide prepared from a portion of the concentrates, using the chlorine apparatus as a generator *pro tempore*. The construction of the apparatus did not admit of a pressure of more than 6 inches of water, yet the precipitation was very satisfactory when aided by warming the solution by a jet of steam. The gold was recovered as a sulphide, easily collected and washed. The sulphur was readily expelled by roasting in an open iron pan (over the assay furnace for the time), the metal assumed its proper golden color, and, after washing with dilute sulphuric acid, yielded a bar of very fine gold when melted without nitre in a black-lead pot.

In the course of these operations, something, I do not remember what, suggested the idea that precipitated copper sulphide would throw down gold from the solution. On trial, I found that it did so, the gold being precipitated rapidly in the metallic state, and the copper remaining in solution as sulpbate. This was better than I had expected; I had supposed that the gold would combine with the sulphur, leaving the copper dissolved as chloride. It appears, however, that the gold terchloride causes oxidation of both the copper and the sulpbur, and it will be readily seen that gold in the presence of a copper salt may be precipitated in metallic state, and but little contaminated by copper sulphide, by means of hydrogen sulphide, and may be further purified by washing in a bath of fresh solution of gold. Following up this idea, I propose to pass the gold solution through a series of vessels containing precipitated copper sulphide, which, in the first vessel, would soon be replaced by pure gold. The first vessel would then be removed, and that which was the second would take its place, while the first, after removal of the gold and recharging with copper sulphide, would be made the last of the series.

The copper passing off in the solution would be recovered by precipitation with hydrogen sulpbide, or an alkaline mono-sulphide, the poly-sulphides being objectionable on account of making a precipitate contaminated by free sulphur, though that could be removed with reproductiou of a certain proportion of the poly-sulpbide, by boiling with caustic potasb, etc.

An attempt to patent this process was defeated by a reference to a remarkably voluminous and comprehensive English patent by which it was forestalled as to its principal feature. I, however, commend it to the consideration of the Deloro Company and others.

[Since the above was received from the author he has sent us the following paragraph, which we now add to the original article.—EDS. PRESS:]

In my communication on this subject, suggesting the use of copper sulphide, I overlooked the fact that in the case of the Deloro Company the formation of sulpburic acid would be objectionable, in the same way as iron sulphate. If their leach contains copper, it seems possible that hydrogen sulphide might cause the same trouble. Sulpburous acid, which is a good precipitant and would cost nothing at the works, may be open to a similar objection in the presence of calcium chloride in the leach. Would it be impertinent to suggest that iron protochloride could be easily made, and will throw down the gold without precipitating the lime? Manganese protochloride also answers. Copper dichloride is a good precipitant, and could be recovered by means of sulphurous acid, though gypsum would also be thrown down; yet the dichloride could be separated by means of warm brine, and used in the state of solution. The addition of a little iron protochloride would prevent the formation of an oxychloride.

Blasting in Mines—No. 13.

Having devoted our attention thus far in this series of articles to systems of blasting, it is proper now to consider the explosives used and the proper way of handling them. High grade explosives are so largely in use now as to be familiar to most miners. The most prominently known of these is

Giant Powder,

Or dynamite, which are the same, giant being the American and dynamite the European name. The Giant Powder Company acquired their patents from the European inventor, Alfred Nobel. This company introduced the dynamite, under the name of giant powder, into the United States. The giant powder, or dynamite, has been improved from time to time. The value of nitro-glycerine powder is regulated by the amount of nitro-glycerine in it, and by a careful manipulation of the ingredients which absorb the oil.

It is not our purpose to take up the question of relative merit of the various explosives or go into the powder question at all, beyond giving such instructions for handling the powder as the companies recommend, and as experience has taught. In doing this it will be necessary to say much that many miners already know, but there are others to whom the information will be useful.

Using Giant, No. 1.

In charging a hole with giant powder, cut the cartridges into sections two or three inches long, and ram each section "well home," with a wooden tamping-bar.

Cut the end of the fuse square, push the cap on it until it nearly reaches the fulminate; then with a pair of nippers press the edge of the cap into the fuse, and in wet holes rub some grease or wax around the cap to make the same air and water tight on the fuse. To insure a perfect blast, the cap must be squeezed tight to the fuse; if loosely put on, the explosion will not be complete.

Push the fuse, with the cap attached, down the bore-hole, until the latter rests on the powder; then put about one inch of loose powder down the hole, and press lightly around the cap, so that the cap, and not the fuse, is imbedded in the powder; then fill the hole with water, or sand, or clay, or use no tamping, as you think best: or you may use a priming cartridge, which means about an inch of cartridge (smaller in diameter than the bore-hole), into which the cap, with fuse attached is inserted, the whole tied together with a string, and then let this priming cartridge down the hole until it rests on the powder. When loose powder is used, put down small quantities at a time, and ram it well home, and use a tin tube with a funnel mouth, to prevent the powder from adhering to the bore-holes.

It is of great importance that only the cap, but never part of the fuse, should be in the powder, as the burning of the latter ignites the powder and burns up all above the cap. This grade is equally good in wet or dry holes, water not affecting it in the least.

Tamping Giant Powder.

From the great strength of this blasting powder, excellent execution is done without tamping the same. Experience shows, however, that when well tamped much more work is done, the amount of power gained being in proportion to the excellence of the tamping. The first four or five inches should be tamped lightly; with the balance no special care need be taken.

Should the fuse fail, and a shot not explode, remove the tamping to within four or six inches of the powder, and put in a heavy primer, and its explosion will "set off" the main shot. Never pick out a shot of giant powder, as it is always attended with more or less danger.

Directions for the Use of Nos. 2 and 3.

Practical experience has proven both these grades superior to any thing ever used in hard and medium-hard rock. In the charging of these powders the same rules are applicable as with No. 1, with the exception that its explosive properties are weakened when brought in contact with water; therefore greater care should be observed in charging wet holes. However, in wet holes, a primer of No. 1 powder will always insure a blast.

These powders are as safe in every respect as the other. The giant powder is so safe that without the giant powder caps it is nearly impossible to explode it.

The Effect of Cold on Giant Powder.

Giant powder freezes at about 44 degrees Fahrenheit, and gradually becomes hard, when it can not be exploded with the giant powder caps.

When received at a mine, and is not already frozen, it should be kept in some warm place, where it can not freeze, to avoid the trouble of thawing it. When the powder is frozen it never should be used for blasting.

The powder may be in a granulated state, apparently soft to the touch, and yet the nitro-glycerine (the explosive property of the powder) be so chilled that its strength is only partially developed by an explosion. Do not use it in that condition.

Frozen powder, when confined in a drill hole, can be exploded by using a heavy primer of thoroughly thawed giant powder No. 1. Never, under any circumstances, attempt to pick out a charge of frozen powder from a drill hole.

How to Thaw Frozen Giant Powder.

1st. Put a layer of cartridges of frozen powder in a box partially filled with hot ashes, or sand, of about 100 degrees Fahrenheit, and cover them well with the same material. Many miners prefer this to any other method of thawing powder.

2d. Put a layer of cartridges in a wooden box and place the box near the boiler in the hoisting works or mill, or other warm place, turning the cartridges from time to time until the powder becomes soft and warm. It is then ready for use. The warmer the powder is when used the greater the execution of the blast. After being well thawed it should be used at once, before getting cold again.

3d. Miners, by placing several cartridges in their boot-legs when going to work, will find the natural warmth of their bodies sufficient to thaw the powder while they are "striking in a hole."

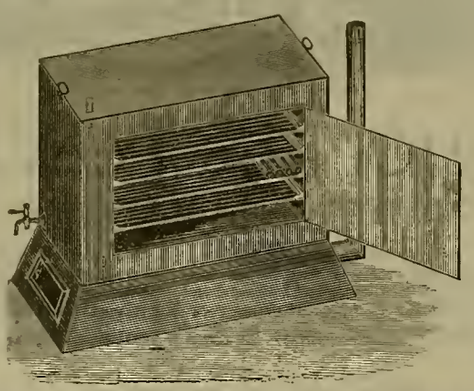
4th. During the winter months keep the powder in a warm, dry room, on shelves or slats; when once thawed out it will remain so.

5th. The above methods are now considered the only real safe ones by which to thaw giant powder.

When the powder is soft and in a pasty condition, it is in perfect order, developing full force when exploded.

In several instances powder has been returned by consumers because they thought it was not good. In every instance, after the powder had remained a few days in a warm room, it proved by testing mortar to be of full strength, and in no way inferior to the best powder.

The furnace for thawing giant powder, and shown in the engraving, is simply a jacketed chamber containing shelves, made of wire, on which the cartridges are laid, a small furnace underneath heating the water in the jacket. By these means the cartridges can never be heated above the boiling point of water, and there is no danger of explosion. The Giant Powder Company are now making these furnaces for use at mines and on railroads. The railroads in Oregon are using these thawing furnaces in large numbers. They are easily carried along, and a fire can be built underneath them on the ground right where they stand, wherever that may happen to be. At mines, the furnace could be placed in any convenient position.



THAWING FURNACE FOR FROZEN POWDER.

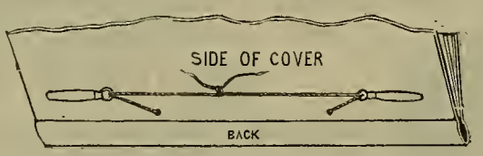
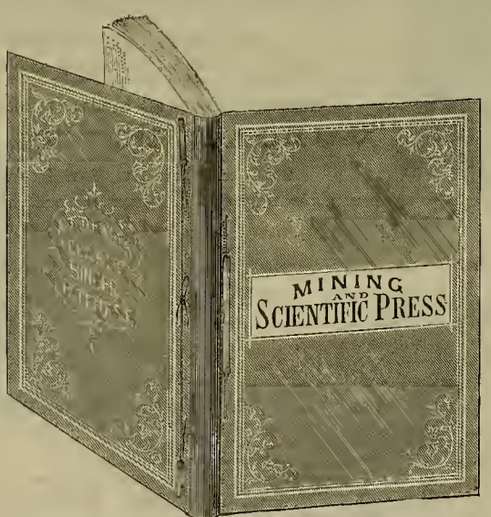


Diagram Showing Manner of Fastening.



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The filing of newspapers for future reference, with a good binder, is an easy and pleasant accomplishment. In many instances we are told by subscribers that they hold the files of our paper of great and increasing value, and we therefore are glad to encourage their preservation by a greater number of readers, believing that in time they will thank us heartily for so doing.

The accompanying engraving illustrates an improvement in file-holders and binders which, it is believed, has advantages considerably in advance of any previously patented.

A careful examination of the illustration will give the reader a ready idea of the construction of the binder. It is composed of two stiff cloth sides, a flexible back, three rubber bands and strong braids tipped with metal points.

Newspaper or other sheets, pamphlets, etc., can be readily adjusted by laying the binder flat open before the operator, with the side having the rings at the right. Place the article to be filed face down on the left half of the cover. Stab the strings through it at least one-third to one-half inch from its back. Pass the strings through the cover and the rings and tie with a bow knot sufficiently taut to hold the sheets strongly in an elastic embrace between the lids of the cover. Care should be taken not to tie the strings too loosely. Again, they must not be tied so close as to bring the rings so as to come in contact with the holes. The simple manner in which the sides, or lids of the cover, are permitted to turn easily by the elasticity of the rubbers, is a novel and successful feature of the invention.

To produce at moderate cost a neat and substantial binder, which would be durable, easily and rapidly handled, has been the aim of the inventor, who in business has long had need of such an article. This object has been accomplished in so simple a manner that the binder has comparatively few parts. The adjustable portions are such as are not likely to be lost, disarranged or worn out quickly. The pointed strings and elastic bands are in such common use as to be obtainable for a trifle at almost any village store. It approaches book-binding to a remarkable degree.

This binder was patented by A. T. Dewey, November 21, 1882. It has been well tested by service since that date, and its construction improved from time to time, until its use seems to give perfect satisfaction.

It is the cheapest of all elastic binders yet offered to the public, and we believe will give the best satisfaction of any, and especially moderately priced binders.

The price for binders, with cloth sides, of suitable size for this paper, *Harpers' Weekly*, or the *Scientific American*, is seventy-five cents. Postage ten cents additional. It will be furnished to subscribers of this paper, with the name of the journal embossed in gilt, for fifty cents, post paid.

Machine for Folding Circulars.

A new machine especially adapted for folding circulars, price lists, etc., which are used by the business men in this country for advertising purposes, has been invented by Mr. Frank A. Brooks, of the Pacific Iron Works, 127 First street, in this city. The large number of circulars sent out by some firms makes it necessary to have one person constantly employed to fold them. This invention greatly reduces such labor, and performs the work in a much neater manner. This machine is adjustable so as to fold any of the ordinary sizes of circulars in any manner desired. It can be run by hand, foot or steam power, its capacity depending upon the adroitness of the attendant. Ordinarily, from 1,000 to 1,500 circulars may be folded in an hour.

The size of the machine is about 14"x14", and it stands 8" high, and weighs about 15 pounds. It is so simply constructed that any one can operate it, and there are no parts liable to get out of order or break. The whole machine presents a handsome appearance, and its usefulness is apparent to any who have seen the result of its work. To any one desirous of going into the business of manufacturing small machinery, the inventor offers favorable inducements.

AS THE steamer *Columbia* was entering the harbor at Panama she was struck by lightning, but the iron foremast acted as a conductor, and little damage was done. Portions of the iron of the ship became magnetized, so that alterations will have to be made. The compass will not point correctly, and a movement of the wheel will deflect it. All of the magnets on board were demoralized.

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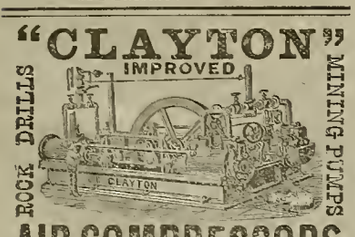
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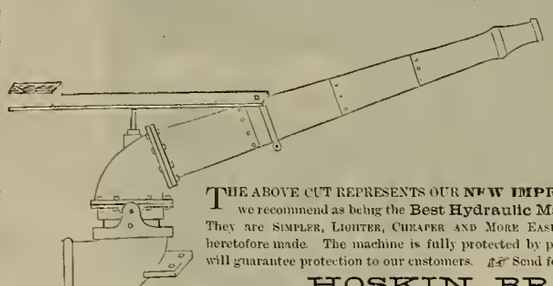
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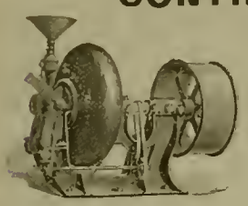
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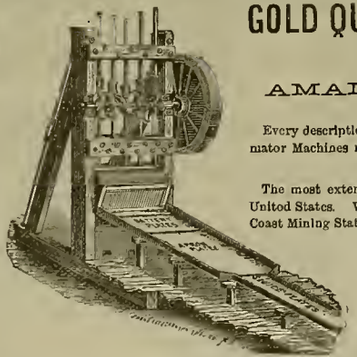
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"DUNCAN" ROCK DRILL!

FOR MINES, QUARRIES, ETC.

J. CUYAS, Agent,

10 Park Place, - - New York.

Recollections of California Mining Life.

Men and Events in the Pioneer Days—No. 1.

[Prepared for the MINING AND SCIENTIFIC PRESS, by HENRY DEGROOT.]

Early Legends and First Important Discovery of Gold.

Although the grand discovery of gold in California occurred not until 1848, there were traditions of its existence here centuries before that time. For nearly three hundred years the impression that this was a gold-bearing country obtained among both English, French and Spanish-speaking peoples, being founded on the reports of navigators along the North Pacific coast, magnified, as was their wont, by the chroniclers of these early times. In the summer of 1579 Sir Francis Drake, the English navigator, entered the bay which now bears his name, and anchoring his vessel remained there several weeks. Before departing he took possession of the country in the name of his sovereign, Queen Elizabeth, and called it New Albion. On his return to England, with a view, probably, to giving importance to his new possessions, Drake represented the country as abounding in gold, so much so that Hakluyt, the historian, in speaking of it declares that "there is no part of the earth here to be taken up wherein there is not a reasonable quantity of gold or silver." Inasmuch as there is no gold or silver anywhere about Drake's Bay, which lies nearly in latitude 38°, and 30 miles north of the Golden Gate, the the above statement is clearly a fabrication of the great navigator. Had Sir Francis went ashore a hundred or two hundred miles further north, where the gold bluffs and beaches occur, there might have been some ground for the representation so made. But as the bay called after him is as far as he voyaged in that direction, the existence of these auriferous deposits avails not to save his veracity from successful impeachment.

But this notion about gold in California did not originate with Drake and his contemporary historian. In the same year that he visited this coast a book was published at Lorraine, in which occurs the following passage. "The soldiers of Vasquirus Coronatus having found no gold in Vivola, in order not to return to Mexico without gold, resolved to come to Quivera (California), for they had heard much of its gold mines, and that Tatarraxus, the powerful King of that country, was amply provided with riches."

After the conquest of Mexico, the Spaniards, incited by the vague stories told them by the natives of the country, were ever engaging in expeditions off this way in search of the precious metals. And when these adventurers arrived in Arizona, here again the inhabitants gave them to understand that the gold producing lands they were so eager to find lay still further to the northwest. In so advising their unwelcome visitors these people might themselves have believed what they said to be true, though possibly this was a ruse to induce these marauders to move on and thus rid the country of their presence. Between the years 1610 and 1660, more than twenty expeditions were sent out from Mexico to explore and occupy the regions to the northwest, under the impression that they abounded not only with gold and silver, but also with pearls, diamonds and other precious stones.

How signally these efforts failed of their object is denoted by the fact that prior to 1848 only a few placers, poor and of comparatively limited extent, were ever found in California; so unimportant, in fact, were these gold finds, that not much was ever heard of them outside the country and very little in it. The first of these placers, which was discovered by the Mexicans as early as 1775, is situated near the Colorado River, in the extreme southeastern angle of the state. Fifty-three years later, deposits of free gold were found at San Isidro, a hundred miles further west, in San Diego County. In 1833, some little gold was gathered in the valley of the Santa Clara river in the northwestern part of Los Angeles County. Five years later, the San Franciscoquito placers, located in the Sierra San Fernando, at a point 45 miles northwest from the Pueblo Los Angeles, were discovered. These, the most productive deposits yet met with, were afterwards worked in a small way for a period of twenty years or more. The deposits at the other places mentioned, owing to their poverty and a lack of water in the neighborhood, were never much worked. And thus it was, that with all these legends and reports about gold in California, the country, prior to the discovery at Sutter's mill, produced very little of that metal, not more perhaps than forty or fifty thousand dollars worth, all told.

As it has been surmised that the Mexican government were not well informed as to the existence of gold in California at the time that they parted with the country under the treaty of Guadalupe Hidalgo, to it may be pertinent state here that such was not the fact. The late Gregory Yale, in preparing his well known work on the legal titles to mining claims and water rights in this state, being obliged to make extensive research among early Spanish archives, discovered there the following document, showing that the Mexican authorities were at that time not only advised as to the existence of placer mines in California, but that the extent and importance of these deposits were greatly exaggerated by the party communicating this information. This document, which consisted of a letter addressed to the President of the Republic by Manuel Castanares, Representative in the National Congress from the Department of California, was published in the city of Mexico in 1845, though it bears the date of March 2nd, 1844, nearly four years before the Marshall-Sutter discovery of gold. This letter, translated for the above work by the expert Spanish scholar, Charles G. Yale, reads as follows:

"The gold placers discovered in the course of last year have attracted the greatest attention, for they extend nearly thirty leagues. The good quality of this metal is made manifest by the certificate of its assay, which was made at the Mint of this Capital, and by the sample which I send to Your Excellency. In order to develop the great elements of wealth in which California abounds, measures ought to be taken only after mature deliberation. I therefore shall have the honor within a few days of presenting to Your Excellency a memorandum detailing these elements, and the means of developing them with very little sacrifice."

A few months later Representative Castanares addressed to the President of the Republic the following additional paper on the same subject:

"The mining interest in California is of great importance, and I have the satisfaction of assuring you that it forms one of the most valuable resources of that department. Besides the silver mines which are found there, and various other mines which have actually yielded metals, the gold placer, especially, is worthy of great attention, which, extending nearly thirty leagues, was discovered lately, together with mines of mineral coal. It is painful for me to have to confess that mining is in a worse state than agriculture; the latter is in its infancy; the former, it can be said, is not yet born, notwithstanding that, according to the nearest estimate of reliable persons in Los Angeles on my departure from that town in December, 1843, there were in circulation about 2,000 ounces of gold, which had been extracted from the above-mentioned placer, the greater part of it destined to go to the United States. This metal contains, according to the certificate of its assay by the Mint of this Capital, which I sent to the government at the beginning of this year, twenty-two carats two and a half grains of gold, fifteen grains of silver.

September 1, 1844."

The foregoing, though a gross exaggeration of the real facts, establishes how thoroughly the Mexican authorities were posted as to any and all gold discoveries that had up till that time been made in California.

Owing to various incidents and events connected with the acquisition of this country by the United States, and the efforts made by our government for establishing steam communication with the Pacific Coast, some have thought that the authorities at Washington had some unpublished advices in regard to the existence of gold here prior to the consummation of the treaty with Mexico and to their contracting for steamers to ply on the routes between New York and San Francisco. In support of this theory, the fact is cited that within six weeks after the time that gold was discovered at Sutter's mill, the treaty ceding to us this country was signed by the contracting parties, the Mexican Commissioners being ignorant of this important event, and our government affecting ignorance of it also. Then, the vessels of the Pacific Mail Steamship Company were required to be ready for service by the month of October, 1848—just the time when the news of the gold find, having excited the more adventurous, had inspired thousands with a desire to emigrate to the new El Dorado. Pointing to this singular contatenation of events, it is argued that the American goverment must have been actuated by some special reasons for burrying treaty negotiations to a close, and for requiring the steamship company to have their first vessel ready to sail at this particular time. In the absence of any stronger evidence than the above, it is fair to presume, however, that officials at the national capitol were no better posted in regard to the existence of gold in California than was the general public, the events cited being mere coincidences, such as might easily happen in transactions of this kind.

That the government was in possession of more full and perhaps accurate information in regard to the mineral and other material resources of this country than the world at large is likely enough, as it would naturally take measures while negotiating the purchase of so much territory to ascertain some thing in regard to its probable worth. In the month of March, 1846, Thomas O. Larkin, then United States Consul at Monterey, in an official letter to James Buchanan, Secretary of State, writes as follows: "There is no doubt but that gold, silver, quicksilver, copper, lead, sulphur, and coal mines are to be found all over California; and it is equally doubtful whether, under their present owners, they will ever be worked." In this expression of opinion, so temperate compared with the statements contained in the letters of Manual Castanres, our Consul may be understood to convey the idea that these various metalliferous deposits, until then so neglected, would be actively worked were the country owned by the United States.

In 1841, James D. Dana, mineralogist to the Exploring Expedition under Commodore Wilks, which that year visited this Coast, made an overland trip from Oregon to San Francisco. In a book on Mineralogy, published by him the next year, this author states that gold was to be found in the Sacramento Valley, and that he had observed auriferous rocks in Southern Oregon, but that he did not consider these deposits of any practical importance. That Consul Larkin, in his letter to the Secretary of State, was speaking in an indefinite way, having but vague ideas as to the extent or value of the deposits he alludes to, is evident from the fact that he makes mention of silver, quicksilver, coal, and sulphur mines, concerning which nothing certain could then have been known. He had, probably, no more exact knowledge of such mines than was common to the inhabitants of the country at that day. They had observed in certain places indications of the presence of these metals and minerals, and surmised that there might be valuable deposits at these points. With regard to gold, Mr. Larkin could speak with more assurance, as small quantities of that metal had for a number of years before been taken out at the San Francisquito placers and brought to Los Angeles, where it was sold at the rate of about twenty dollars per ounce. As these were the placers to which Senor Castanares must have referred in his communications to the Mexican government, the extravagance of his language in describing them becomes manifest, when we reflect upon their limited extent and the sorry showing they have since made in the gold product of the country.

The foregoing comprises about all the knowledge extant touching the occurrence of gold in California prior to January, 1848.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F

FOR WEEK ENDING OCTOBER 23, 1883.

286,993.—FLOWER-POT HOLDER AND SHIELD—Wm. A. Birch, S. F.

287,094.—STATION INDICATOR—W. W. Campbell, S. F.

287,003.—NUT LOCK—F. H. Crawford, Redding, Cal.

287,256.—ORE GRINDER AND AMALGATOR.—Peter Eddy, Nevada City, Cal.

287,261.—BARBED WIRE FENCE—J. E. Evans, Spanish Fork, U. T.

287,374.—CAR TRUCK—Thos. J. Furbee, Bishop Creek, Cal.

287,118.—LAND MARKER—L. Gairaud, Santa Clara, Cal.

287,276.—SEWING MACHINE—Geo. Gowing, S. F.

287,377.—CABLE GRIP—A. Haman, S. F.

287,028.—INDICATOR PADLOCK—A. Jackson, S. F.

287,290.—INTEREST INDICATOR—H. E. Jenne, Ben Lomond, Cal.

287,307.—CONVERTING MOTION—R. G. Moody, San Jose, Cal.

287,165.—BED LOUNGE—F. Rentschler, S. F.

287,166.—PHONOGRAPH—C. C. Reynolds, Prescott, A. T.

287,326.—DRILLING MACHINE—John Richards, S. F.

287,173.—ORE CONCENTRATOR—C. C. Rueger, S. F.

287,178.—CAISSON GATE—Geo. F. Schild, Vallejo, Cal.

287,198.—CRANK HANDLE FOR LIFTING-JACKS—J. M. Vance, Eureka, Cal.

287,202.—CAR AXLE—A. Walton, S. F.

10,658.—TRADE MARK—Franco-Cal. Packing Co.

3,265.—LABEL—Pacific Vinegar Works, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific Coast Inventors transacted with perfect security and in the shortest possible time.

AS A TRUE and efficient tonic, and one that excels all other iron medicines, take Brown's Iron Bitters.

The Distant Sierra.

(CONTINUED FROM PAGE 286.)

posed to be the highest in that district. When we returned to camp that night we received, by mail, from Visalia, the news of President Garfield's death, which occurred on the 19th. At your correspondent's suggestion, this handsome peak was named after our worthy President, who had fallen by the hand of a dastardly assassin. We trust the mountain will ever retain the name. It is very distinctly recognized from our prairies. The altitude of Miners' Peak is approximately 12,800 feet, and of Mt. Garfield, 13,100.

Bullion Peak is a regular, snow-capped cone, near Farewell Gap and the head of Little Kern River, which, though a stream twenty-five miles long, does not appear on any map of California yet prepared.

Every point marked in the accompanying engraving has now been explained except the letter "B." This represents the locality of the great and celebrated canyon of the main Kern, at about its middle point.

The Main Kern,

Rising near the base of Mt. Benet, along the steep southern slopes of the high divide between it and King's River, runs almost due south for at least 40 miles, through the longest and grandest canyon of all the Sierra Nevada. Its perpendicular walls are from 2,000 to 4,000 feet high, and scarcely a mile apart; its waterfalls are from 1,500 to 3,000 feet high; and it is fed on the east by Tyndall Creek, Moraine Creek, Whitney Creek, Loomis Creek, and Volcano Creek, in succession, from north to south; and on the west by Cone Creek, Shagoopah Creek, and Falls, and Crabtree Creek, having but two possible trails for entrance and exit over its east face, and two on its west face, for its length of 40 miles. The Little Kern empties into it from the west, still farther south. The Kern and its tributaries abound with the golden, or rainbow, trout.

Here, among our highest mountains, the curious and beautiful red-snow occurs, identical with that of the Arctic regions and the Alps, caused by that microscopic fucoid plant, *Protococcus nivalis*. From July to September it is found in the Mineral King district, near the White Chief ledge, and in Farewell Gap; also, just north of Mt. Abert, the Old Mexican mine in the head of Jenny Lind Canyon, and along the high ridges and gorges near Mt. Whitney, at altitudes from 10,000 to 12,000 feet.

Errors Corrected.

Having now reviewed with my old friends and acquaintances of the PRESS this 120 miles, or thereabouts, of the grand panorama of our California Alps, I shall close this sketch by correcting three important errors in vogue about the mountain region we have been discussing.

The expeditions of 1881, already referred to, decided these matters conclusively. 1st. It has been stated in many ways that the snows of Mt. Whitney feed the San Joaquin and King's rivers as well as the Kern. This is all a mistake. As pointed out above, of these three large rivers only the Kern is fed by it. The sources of Bubb's Creek and Roaring River, the extreme southern tributaries of King's River, are fully eight miles north of Mt. Whitney, with a lofty rocky barrier between them, while the south fork of the San Joaquin does not come nearer than 40 miles to Mt. Whitney, its extreme sources being on the northeastern slope of Mt. Goddard, between it and the Palisades. 2d. By some the main Kaweah River is supposed to flow from Mt. Kawcah. The fact is that the whole of the Kaweah Buttes furnish water to no stream but the Kern, and that through Cone Creek, Crabtree Creek, and the small creeks which form the high falls on the west face of Kern Canyon. 3d. The height of Mt. Whitney has heretofore been overestimated.

Altitude of Mt. Whitney.

During five days of careful observations by Prof. Langley's party, from Sept. 1st to 6th, 1881, the mercurial barometer varied from 17.50 to 17.60 inches, while the aneroid of your correspondent gave 17.55 to 17.60 on Sept. 6th. Prof. George Davidson did me the favor to have these elements worked out at the Coast Survey Office, by the formulæ for the mercurial barometer, comparing the reading on Whitney with the corresponding readings of the Signal Service instruments at San Francisco on the same dates. These figures gave the altitude about 14,700 feet. I worked out the same by the formulæ for aneroids, using the readings of corresponding dates in the Signal Office at Visalia. This gave 14,800 feet. Hence, 14,750 feet is no doubt more nearly correct for the altitude of Mt. Whitney than 15,000 feet. Even at these figures, Mt. Whitney is still the highest mountain in the United States except Mt. St. Elias in Alaska, with its 19,500 feet of altitude. An interesting point in our Tulare Sierras is a ridge where the sources of King's, Kaweah and Kern rivers are within a stone's-throw of each other. This point is immediately north of Mt. Abert, the most northerly peak of the Kaweah Buttes, and about ten miles due west from Mt. Whitney. From there the main Kaweah runs nearly west, Roaring River runs northwest, into King's River, while Cone and Crabtree creeks run southeast to the Kern.

A Moonlight View

Of our distant Sierras is a phenomenon peculiar to this locality. What! See mountains 70

miles distant by moonlight? Yes, incredible as it may seem to those who have never witnessed this wierd and mysterious view of our snowclad mountains, they are sometimes seen by moonlight, under two conditions: Just as the moon is rising behind them, and a little before, a narrow waving line of pale golden light marks the profile of the Sierras, as the snow on the summit line is illuminated by the moon's rays. But the most peculiar sight is when the moon, near the full, has reached the zenith on our clear, cold winter nights. Look then to the eastern horizon, and there, dimly but surely, you see the vast snow fields of our Sierra Nevada reflecting the soft light of the moonbeams. At first you think it is white, fleecy clouds, but as you gaze steadily you see there is no motion, no change, as there would be if it were clouds. It remains there as calm and unchanging as the solid mountains themselves appear in the sunshine. You are really viewing by moonlight the perpetual, Arctic-like snow-masses of our California Alps.

Conclusion.

Having now examined together somewhat in detail this wonderfully grand panorama of our higher Sierra, we must take leave of them, just as the writer of this sketch will soon do of all the scenes of our beloved California; but the memory of these grand views, once seen, will always remain with a sincere admirer of nature, and of these grandest achievements of nature's Architect. Just as these everlasting mountains appear to us now, they have appeared to man's eye for at least forty centuries—from the time when the giant redwoods of our mountain meadows first began to burst through their tiny seed shells. There they have stood, so little changed by the frosts of succeeding winters as to appear ever the same,—standing, poetically, as the sentries of this great and fertile valley; practically as its ventilators and air purifiers, and as a rich storehouse of waters, metals, building stones and timber. We see them today just as the forefathers of the American races saw them many centuries ago, when they came from Asia by way of Behring's Straits and the Aleutian Islands, along our Pacific Coast, and through Tulare Valley—the Toltecs and the Aztecs—on their way to the table-lands of Mexico. There they stand, just as they have been seen and venerated for ages by the wild Indians, for whom a large part of them, no doubt, were ever shrouded in mystery.

As we see them, they are likely to remain till the end of time, as one of the most tangible proofs of the unchanging nature of God's laws, and among the noblest monuments of his handiwork.

HUBBER'S HEATER AND PURIFIER.—This California invention has been very successfully applied on this Coast as an economizer of fuel and as a purifier. Where water contains minerals or impurities the purifier has acted so as to perfect a complete separation of the impurities, so that clear, pure water passes up into the boiler. Its action is such as to remove scale from boilers and prevent greatly its deposition; and, owing to the pure state of the water entering the boilers, the evil of foaming is prevented, while the injury to valves and packing that result from the passage of grit is obivated. This heater and filterer has been put at work in this city in several places where the water from the wells is bad, and those who have used it express their satisfaction with the results. The appliance received the first premium for the best heater and purifier at the recent Mechanics' Institute Exposition in this city. We shall shortly describe it more fully.

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, Nov. 1, 1883.

ANTIMONY—Per pound		14 @	15
IRON—American Pig, soft, ton		30 00 @	—
Scotch Pig, ton		36 00 @	27 50
American White Pig, ton		— @	—
Oregon Pig, ton		@	—
Clipper Gap, Nos. 1 to 4		32 50 @	35 00
Refined Bar		4 @	—
Horseshoes, keg		5 50 @	—
Nail Rod		7½@	—
Norway, according to thickness		6@	7
STEEL—English Cast, lb		16 @	25
Black Diamond, ordinary sizes		14 @	—
Drill		15 @	16
Machinery		12 @	14
COPPER—Ingot		22 @	—
Sheet		31 @	35
Sheeting, Yarnell, 14x18		22 @	23
Nails		17 @	—
Bolt		31 @	—
Oil		8 @	—
Bar		— @	—
Cement, 100 lbs		1.75 @	—
LEAD—Pig		4½@	4
Bar		6 @	—
Pipe		7 @	—
Sheet		8 @	—
Shot, discount 10 % on 500 bags: Drop, ₱ bag		2 10 @	—
Buck, ₱ bag		2 30 @	—
Chilled, do		2 50 @	—
TIN PLATES—Charcoal		7 55 @	—
Coke		5 50 @	5 75
Banca Tin		25 00 @	—
Australian		25 00 @	—
I. C. Charcoal Rooting, 14x20		6 50 @	6 80
ZINC—By the cask		10 @	—
Sheet, 7x3 ft, 7 to 10 lb, less the cask		90 @	—
NAILS—Assorted sizes		3 30 @	4 75
QUICKSILVER—By the flask		34½@	—
Flasks, new		1 05 @	—
Flasks, old		85 @	—

Is your wife's health poor? Are your children sickly? Give them Brown's Iron Bitters. It will revive them.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

REMITTANCES to this office should be made by postal order or registered letter, when practicable. Cost of postal order, for $10 or less, 8 cents; for registered letter, in addition to regular postage (3 cts. per half ounce), 10 cts

STRENGTH

to vigorously push a business, strength to study a profession, strength to regulate a household, strength to do a day's labor without physical pain. All this represents what is wanted, in the often heard expression, "Oh! I wish I had the strength!" If you are broken down, have not energy, or feel as if life was hardly worth living, you can be relieved and restored to robust health and strength by taking BROWN'S IRON BITTERS, which is a true tonic—a medicine universally recommended for all wasting diseases.

501 N. Fremont St., Baltimore

During the war I was injured in the stomach by a piece of a shell, and have suffered from it ever since. About four years ago it brought on paralysis, which kept me in bed six months, and the best doctors in the city said I could not live. I suffered fearfully from indigestion, and for over two years could not eat solid food and for a large portion of the time was unable to retain even liquid nourishment. I tried Brown's Iron Bitters and now after taking two bottles I am able to get up and go around and am rapidly improving.

G. DECKER.

BROWN'S IRON BITTERS is a complete and sure remedy for Indigestion, Dyspepsia, Malaria, Weakness and all diseases requiring a true, reliable, non-alcoholic tonic. It enriches the blood, gives new life to the muscles and tone to the nerves.

DELINQUENT SALE NOTICE.

Seaton Gold Mining Company.—Location of principal place of business, San Francisco, Cal.; location of works, Drytown, Amador county, Cal.

NOTICE.—There is delinquent upon the following described stock, on account of assessment (No. 4) levied on the 27th day of September, 1883, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Martin, A, Trustee	34	5,000	$500 00
Martin, A, Trustee	35	5,000	500 00
Martin, A, Trustee	38	5,000	500 00
Martin, A, Trustee	42	5,000	500 00
Martin, A, Trustee	43	10,000	1,000 00
Martin, A, Trustee	48	2,000	200 00

And in accordance with law, and an order of the Board of Directors, made on the 27th day of September, 1883, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, No. 224 California Street, San Francisco, Cal., on MONDAY, the 19th day of November, 1883, at the hour of 1:30 o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

CHAS. T. BRIDGE, Secretary.

OFFICE—224 California St., San Francisco, Cal.

Cheap Ore Pulverizer.

There is for sale in this city, by I. A. Heald, American Machine and Model Works, 111 and 113 First St, a Rutherford Pulverizer, an improved revolving barrel crusher, which was only used a few times and is as good as new. It will be sold very much below cost, and miners who are in need of such an appliance for a small mine will do well to make inquiries concerning it. It is suitable for a pulverizing mill for powder or other substances. Reference as to above can be had upon applying to this office.

California Inventors Should consult DEWEY & CO. AMERICAN AND FOREIGN PATENT SOLICITORS, for obtaining Patents and Caveats. Established in 1860. Their long experience as journalists and large practice as Patent Attorneys, enables them to offer Pacific Coast Inventors far better service than they can obtain elsewhere. Send for free circulars of information. Office of the MINING AND SCIENTIFIC PRESS and PACIFIC RURAL PRESS, No. 252 Market St., San Francisco. Elevator 12 Front St.

INFORMATION WANTED.—Information is wanted of Wm. Erskine, who has been living near Hailey, Alturas county, Idaho Territory, for two years past. His wife has not heard from him since last Spring. He was President of the Miners' Union of Silver City, Idaho, five or six years ago. Any news of him would be thankfully received by Mrs. Hannah Erskine, of Nevada City, Cal., or R. H. McDonald, Los Angeles, Cal.

MECHANICS' INSTITUTE INDUSTRIAL EXHIBITION.

(Of the City of San Francisco.)





PREMIUMS AWARDED—1883.

THE HUBBER FEED-WATER HEATER AND PURIFIER.

PATENTED MAY 8, 1883.

First Premium Awarded.

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GEORGE CUMMING & CO.,

MANUFACTURERS OF

Machine Tools, Hydraulic Machinery and PORTABLE FORGES,

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Awarded 1st Premiums for Engine and Lathe, & Special 1st Premium for Portable Forge.



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21 New Montgomery St., - - San Francisco, Cal.

Woven Wire Mattress!

Awarded

FIRST PREMIUM FOR BEST SPRING BED, MECHANICS' FAIR, 1883.

GOLD MEDAL AWARDED

—AT—

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—FOR—

Automatic Cut-Off Engine.

SILVER MEDAL AWARDED

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HIDDEN TREASURE.



CLOSED. CHAIR OPEN.

Took FIRST PREMIUM and MEDAL as best Extension Bed, Mechanics' Fair, 1883.

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W. T. Y. SCHENCK,

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CHAMPION METALLIC WHEELBARROWS.

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DEWEY & Co., Publishers,

No. 252 Market St., S. F.

BOUND VOLUME OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce, and valuable for future reference and library use.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $4 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turning a leaf.

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SACRAMENTO, CAL.

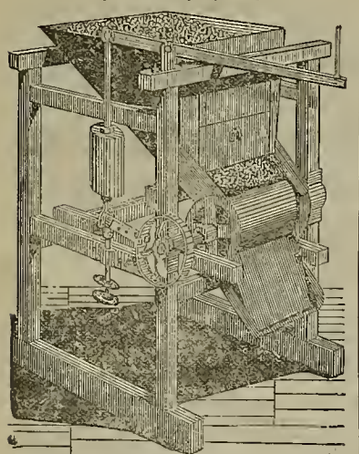
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This is the best and cheapest Ore Feeder now in use.
It has fewer parts, requires less power, is simpler in adjustment than any other. Feeds coarse ore or soft clay alike uniformly, under one or all the stamps in a battery, as required.
In the Bunker Hill Mill it has run continuously for two years, never having been out of order or costing a dollar for repairs.
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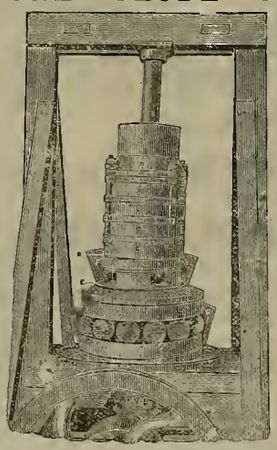
NOTICE TO CREDITORS.

ESTATE OF ROSEMOND GREENWOOD, deceased.—Notice is hereby given by the undersigned executor and executrix of the last will and testament of Rosemond Greenwood, deceased, to the creditors of, and all persons having claims against the said deceased, to exhibit them with the necessary vouchers, within four (4) months after the first publication of this notice, to the said executor and executrix, at the office of E. W. Blancy, Esq., attorney-at-law, No. 529 Montgomery Street, the same being the place for the transaction of the business of said estate, in the City and County of San Francisco.
Dated at San Francisco, the 2d day of October, 1883.
GEORGE SPAULDING,
MARY WILLIAMS,
Executor and Executrix of the last Will and Testament of ROSEMOND GREENWOOD, deceased.

COKE. PATENT. COKE.

This COKE is exclusively used by Prof. Thomas Price, in his assay office, by the Selby Smelting and Lead Co., Prescott, Scott & Co., Risdon Iron and Locomotive Works and others in this city. Large supplies are regularly forwarded to consumers in Salt Lake and Nevada, to the Copper Queen Mining Co., Longfellow Copper Mining Co. and other consumers in Arizona.
The undersigned are in receipt of regular supplies from Cardiff, Wales, and offer the COKE for sale in quantities to suit purchasers.
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DYER CANNON BALL QUARTZ MILL.
OFFICE AND WORKS:
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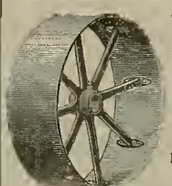
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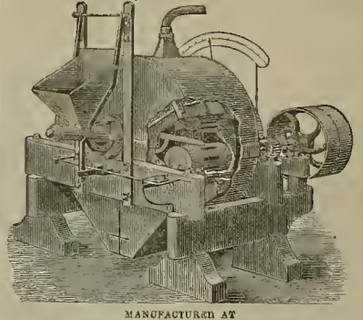


PAT. OCT. 25, 1881.
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Sole Licensed Manufacturers of the
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For the States of California, Oregon and Nevada, and the Territories of Idaho, Washington, Montana, Wyoming, Utah and Arizona. Lightest, Strongest, Cheapest and Best Balanced Pulley in the World. Also Manufacturers of
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W. H TAYLOR, Pres't. JOSEPH MOORE, Sup't
Builders of Steam Machinery
IN ALL ITS BRANCHES,
Steamboat, Steamship, Land
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STEAM VESSELS, of all kinds, built complete with Hulls of Wood, Iron or Composite.
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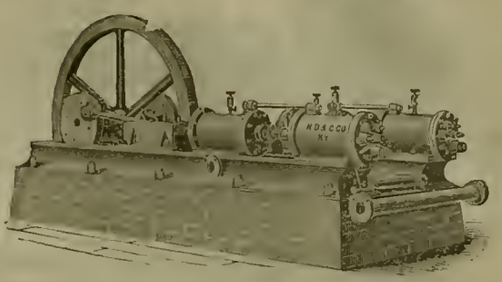
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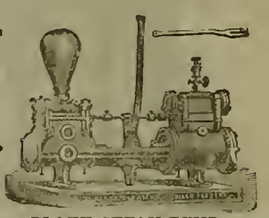


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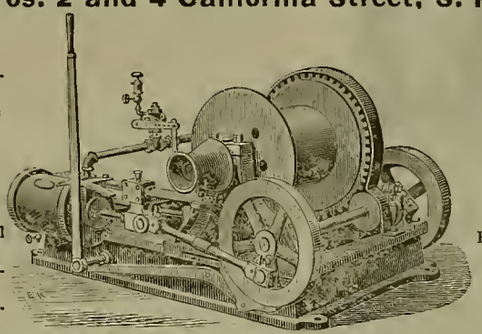


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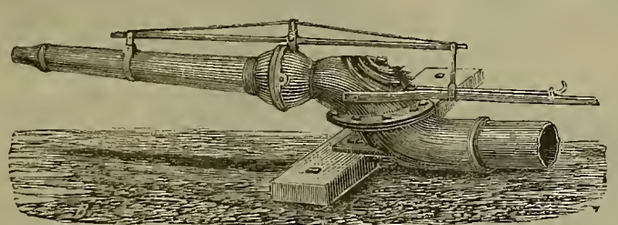
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All of the usual sizes are manufactured (under an exclusive right) and for sale at reduced prices by JOSHUA HENDY, at the

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PORTABLE AND STATIONARY

STEAM ENGINES

From Ten to Two Hundred Horse Power, Steam Boilers of any Style and Capacity.

SAW MILLS

Adapted to wants of the Planter, Miner, or for the manufacture of Merchant Lumber, Prices ra ing from

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Upwards, and of Capacity from 2,000 to 50,000 Feet per day. Shaftings, Hangers, Pulleys, Gearing, and all Appliances for the Transmission of Power.

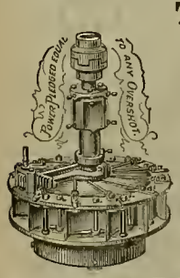
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The "Old Reliable,"

With Important Improvements, making it the

MOST PERFECT TURBINE NOW IN USE,



Comprising the **Largest** and the **Smallest** Wheels, under both the **Highest** and **Lowest** head used in this country. Our new Illustrated Book sent free to those owning water power.

Those improving water power should not fail to write us for **New Prices,** before buying elsewhere. New Shops and New Machinery are provided for making this Wheel. Address

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CHILLED CAR WHEELS.

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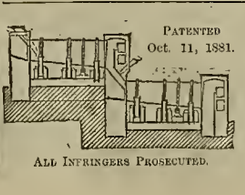
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PACIFIC POWER CO.

Room with steam power to let in the Pacific Power Co.'s new brick building, Stevenson street, near Market. Elevator in building. Apply at the Company's office, 314 California street.



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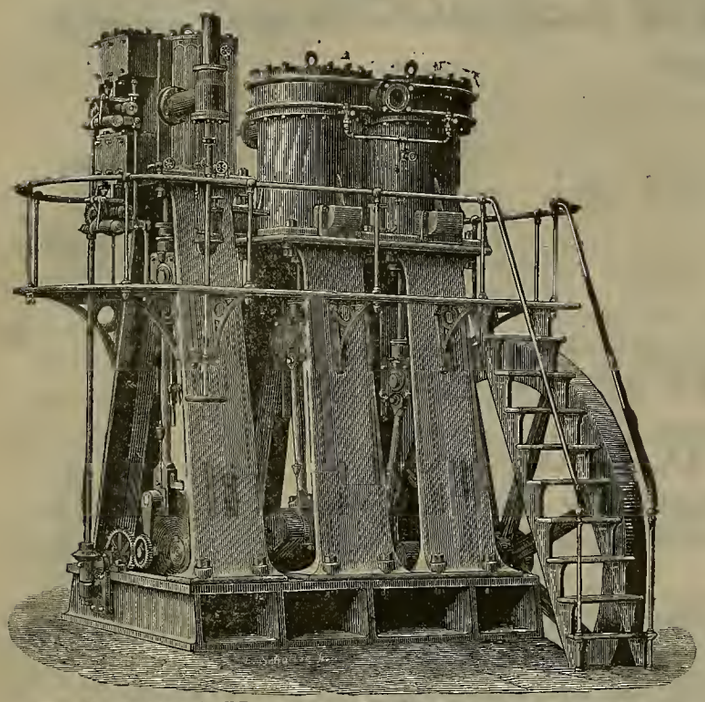
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Patent Ore Roasting and Chloridizing

FURNACE.

Working up to 93 per cent. of Fire Assay, using 25 per cent. less salt since July, 1882. LICENSES FOR USE FOR SALE, or FURNACES CONSTRUCTED. Address R. A. NEVIN Patentee, Box 1670, SAN FRANCISCO, CAL.



With Adjustable Cut-off Poppet Valve Engine, and Forced Iron Crank Shafts.

Mining Machinery Depot,

PARKE & LACY,

21 and 23 Fremont Street. S. F.

NO. 7 IMPROVED

AIR COMPRESSOR.

SPECIAL ADVANTAGES.

Absolute certainty in the action of the valves at any speed. Perfect delivery of the air at any speed or pressure. The heating of the air entirely prevented at any pressure. Takes less water to cool the air than any other Compressor.

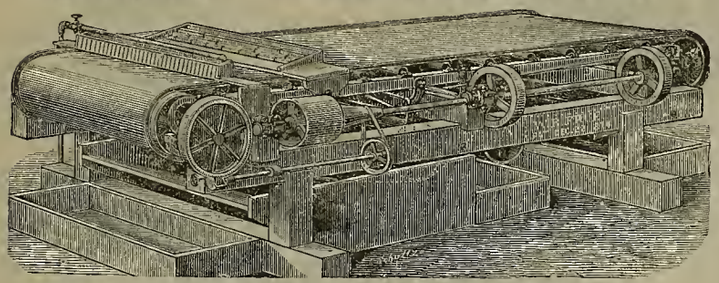
Power applied to the best advantage. Access obtainable to all the valves by removing air chest covers. Entire absence of springs or friction to open or shut the valves. No valve stems to break and drop inside of cylinders.

Have no back or front heads to break. The only Machine that makes a perfect diagram. No expensive foundations required. Absolute economy in first cost and after working.

DISPLACEMENTS in air cylinder perfect. Showing less leakage and friction than our competitors and a superior economy of about 20 per cent.

Small Sizes made in Sections not to Exceed 300 lbs.

$1,000 CHALLENGE!



THE FRUE ORE CONCENTRATOR,

—OR—

VANNING MACHINE.

Over 500 are now in use, giving entire satisfaction. Saves from 40 to 100 per cent. more than any other Concentrator in use, and concentrations are clean from the first working. The wear and tear are merely nominal.

A machine can be seen in working order, and ready to make tests, at the office of Hinckley, Spiers & Hayes, 220 Fremont Street.

To those intending to manufacture or purchase the so-called "Triumph" Concentrator, we herewith state:

That legal advice has been given that *all shaking motion* applied to an *endless traveling* belt used for concentration of ores is an infringement on patents held and owned by the Frue Vanning Machine Company.

That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.

That the patent laws make *users* of infringements responsible as well as makers, and the public is therefore warned that there is considerable risk in purchasing any end-shake machine until our various patents have been decided.

That if there are those who for any reason prefer an end-shake machine, we can manufacture and sell to such machine of that description, as efficient as the Triumph, and at a lower price, and no liability for infringement will then be incurred by the purchaser.

That we shall protect ourselves against any one making, selling or using any machine infringing any of our patents. Patented July 9, 1867; May 4, 1869; Dec. 22, 1874; Sept. 2, 1879; April 27, 1880. Patents applied for.

That we are, and have been, ready at any time, to make a competitive trial against the Triumph, or any other machine, for stakes of $1,000.

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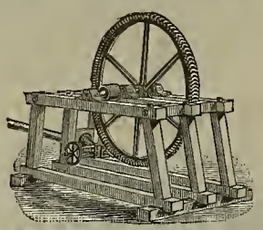
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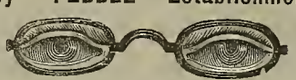
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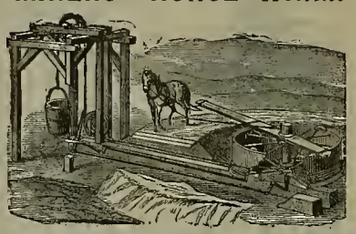
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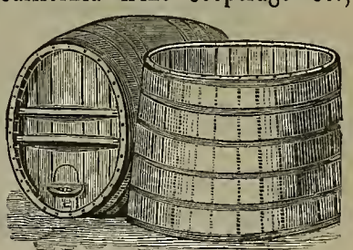
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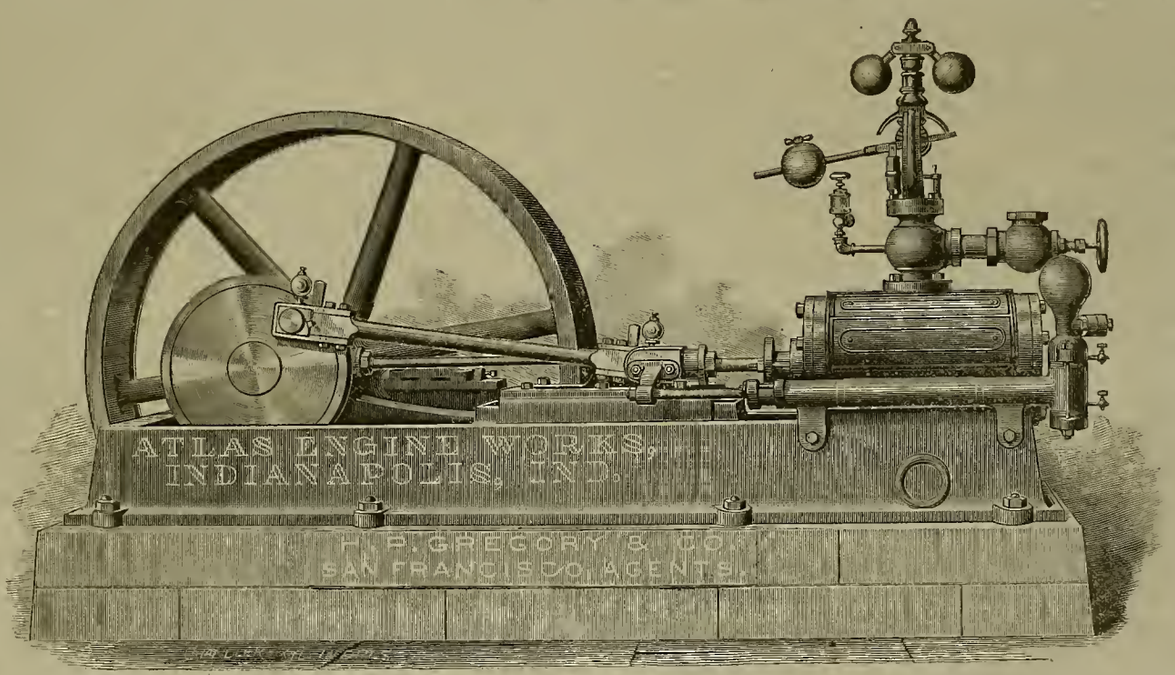
SAN FRANCISCO, SATURDAY, NOVEMBER 10, 1883.

VOLUME XLVII
Number 19.

The Atlas Engine.

The engraving on this page represents the slide valve engine made at the Atlas Works, and the agency of which for this Coast was not long since obtained by H. P. Gregory & Co. It is claimed for these engines as their principal feature that they are simple and strong, with large and carefully fitted bearings, and superior distribution of metal for the working strains. They are particularly adapted for heavy work. The company making them employs 400 men exclusively on these engines and boilers; and from the fact of their giving their undivided attention to one class of work, are enabled to build cheap and well. T. M. Antisell, piano maker in this city, is using one of these engines. They are also in the saw mills of Andrew Markham, of Duncan's Mills. F. Hind, Santa Cruz; Clow Bros., Booneville, Lake Co.; Hastings and Tunis, Lakeport, and at several other places where they are giving satisfaction.

The engraving shows a front view of the engine. The cylinder is well made and the proportions are sufficient to admit of a piston speed of 600 feet per minute. The frame or bed plate is of box form, having a closed top. The main bearing is of improved design. The connecting rod is of forged wrought iron, and boxes of gun metal. The governor has an automatic stop motion and is of approved construction. Durable and self-adjusting packing is used for piston. The main shaft is forged from selected iron, and is of large diameter. The band-wheel is of ample size to transmit by belt the full power. A plunger pump and heater go with the engine.



THE ATLAS SLIDE VALVE ENGINE.

THE shipments of quicksilver from this port during the month of October amounted to 2,881 flasks, including 1,800, to New York, the largest quantity sent to that market by water in any single month in years. There were only 35 flasks to Hongkong, the smallest quantity sent to that market in years. The shipments to Mexico were only 500 flasks, owing to the quarantine regulations there. The total for October, 1882, was 2,120 flasks. The shipments for the ten months ending October 31st were 37,731 flasks, worth $750,013. Though we have shipped 7,700 more flasks this year than last the remuneration is $127,000 less.

THE Mount Diablo coal mine produces about 7,500 tons a month.

Profits of Mining.

The idea of ex-Senator Stewart, of Nevada, going to New York and telling the people there that mining is not and never has been profitable, strikes any one knowing anything of the subject as extremely ridiculous; and it is still more absurd to see newspapers here copying the interview, and partly indorsing it. Mr. Stewart, however, has been misrepresented. What he did say, in answer to a question as to why hydraulic miners did not build their own dams, was "that if they were compelled to build the dams the business would be no longer profitable. It is too much of a burden on them to take care of the tailings deposited by their predecessors."

There is no possible way of verifying any estimates on the profits of mining. Many people—in fact most people—confound the stock market profit and losses with those of mining itself. California has produced a long way over a billion of dollars in gold since mining was commenced; and even if it cost that much to get it out—which it did not—the world is richer by that billion of dollars than it was before. It is pure production. The new dollar is so much added to the world's wealth. On this subject, in a recent government work on the Mineral Resources of the United States, the following official statement is made:

The production of gold and silver, like that of other commodities, is of course not one of clear profit. Indeed, a saying that it costs one dollar in coin to produce one dollar in bullion has gained more or less credit; and though this opinion has been abundantly shown to be unfounded, and while also any attempt to estimate the profit gained to the country by the mining of the precious metals is mere guesswork, it is still quite probable that $500,000,000 of the gross total has been net profit.

The Manufacturers' Association.

The final arrangements for perfecting the organization of this Association will not be made until next week, when the committee will report. A meeting was held this week, however, with Irving M. Scott in the chair, and J. H. Gilmore as Secretary. A resolution was presented by A. S. Hallidie, as follows:

Resolved, That this Association proceed to form itself into a body politic and incorporate under the laws of the State of California, to be known as the "Manufacturers' Association of the state of California," and that articles of incorporation be immediately proposed and executed by the necessary number of its members, and filed in the proper offices as required by law.

Resolved, That we now proceed to elect from our number eleven persons who shall act as directors and trustees for the first year.

The resolution was adopted, and a ballot was taken and the following gentlemen were elected: A. S. Halladie, W. Harvey, W. T. Garratt, Irving M. Scott, M. W. Spaulding, S. P. Taylor, A. H. Phelps, David Kerr, Albert Tubbs, Arpad Haraszthy and Isaac Hecht. The meeting then adjourned until Monday next at 3 P. M.

THE mines of the section distinctively known as Southern California are increasing in their output at a capital rate. The fact is, that from the region which is unmistakably tributary to Los Angeles three hundred thousand dollars a month is being turned out in bullion, and this is but the initial of a splendid era of development. The most prominent contributors to this superb total are the King, which turns out between $50,000 and $60,000 a month, the Providence Mountain, with between $60,000 and $70,000, the Albambra, with about $30,000, and numerous other mines which turn out bullion in lesser measure.

Patenting Mines.

So much has been said about the benefits of patenting mining claims that it would seem as if all miners would recognize them. It is a fact, however, that too many neglect this important duty, and when the time comes when they have an opportunity to sell, it is lost through neglect of ability to guarantee title. A government patent is accepted as a guarantee of good title. Before it can be procured certain forms have to be gone through and adverse claims settled, so that a patented claim is free from possible legal entanglement, too apt to encircle those which have not been put to test.

So well are these facts recognized by experts and capitalists, that a very good mine will often be refused if not patented. The parties who buy unpatented mines now, insist on retaining part of the purchase money until the patent is forthcoming. And this is no more than just. If there is any flaw it will come out during the patent application proceedings, though none may have been apparent during many years of undisputed possession. Instances are so numerous where flaws have appeared that purchasers are not safe unless they protect themselves in some way like this. Every miner with a claim worth working ought to consider it worth patenting. A good mine with a poor title is not an enviable property; better have a comparatively poor mine with a good title. A man with a promising location which is patented will stand many more chances of seeing it sold than one of which he has merely a possessory title. These questions should be seriously considered by all miners, who, while developing a good property, should see to it that they perfect a good title also.

THE steamer Otter has brought to Victoria $1,600 in gold dust, which was obtained from McDame and party, which they discovered on a new creek, a tributary of the Skeena. The party panned out from eight to twenty dollars per day by hand, and they will winter in the new diggings, expecting great results.

THE pay roll of the Ophir, Mexican and Sierra Nevada aggregates $30,304. The pay roll of the Consolidated Virginia, C. and C. shaft and California amounted to $12,171.75; Union shaft, $9,649.25; Utah, $3,769.50.

CORRESPONDENCE.

An Arizona Mine.

Ancient Mining Ground Re-worked.

EDITORS PRESS: In company with a rather dilapidated vehicle, called by courtesy a "stage," dragged at a funeral pace hy two forlorn representatives of equine ahility and incompetence, and crammed with demijons, hundles and hoxes, among which the five passengers were expected to hestow their hundred delicate pedal extremities as best they might, the whole under the superintendence of an ohliging and companionable jehu, whose musical sihilation filled the intervals of conversation with melodious warblings, I set out from Prescott to view the now famous mines of the United Verde Copper Company. I say in company with the aforesaid vehicle, etc., because although I and the other passengers were enahled to travel on wheels over the level or descending portions of the road, yet such was the disproportion of the weight to be moved to the power provided for moving it, that whenever a hill was to be ascended (and several pretty long oues were encountered) it hecame necessary for all that portion of the load that was capable of self-propulsion to have recourse to that, the said power harely sufficing to impart motion to the inanimate part.

At two hours past the proper time we arrived at Gillett's station, where a substantial square meal awaited us for the moderate consideration of "four hits," the proprietor of the wayside hotel not having yet attained to the altitude of avarice which characterizes some of his confreres in these parts. Ahout dark we reached the smelter, having made the stupendous journey of 27 miles in the short space of 10 hours.

The letter of introduction from His Excellency the Governor, with which I was armed, was scarcely needed to insure me a cordial reception; and the kind hospitality of the Superintendent, Mr. F. F. Thomas, soon made me feel at home. Indeed, a pleasanter set of gentlemen than the officers of this company, including Mr. Burk, the New York Secretary, who is here on a mission of husiness, it would be difficult to find; and small hlame to them for that same. The ownership of such a property as I saw here would make the veriest curmudgeon that ever lived to crack his crusty visage with an unwonted grin.

Primitive Miners.

This mine, or group of mines, was discovered at some ohscure date in the remote past of this interesting country, though whether hy Spanish explorers or by members of some native tribe I can not say. Whoever they were, they seem to have sought the red oxide of copper, in pursuit of which they burrowed into the mountain in a style more suggestive of gophers than of human miners. It has been suggested that they used this richly colored ore as a pigment; I did not hear of any remains of metallurgical operations having heen found.

In addition to the excavations made by these primitive miners, they have left their traces in the form of fragments of painted pottery, stone hammers, implements of horn, bones (probahly of deer), and a piece of wood on which was painted a red cross, suggestive both of a Christian people and of the use to which they applied the ore which they extracted.

The Mines were Rediscovered

And partially opened some four or five years ago, and when bonded by the present owners were already in a coudition of developement to justify expectations which are now much more than realized.

The history of this property, as of many others in Arizona, affords a flagrant instance of the unreliahility of reports made hy geological experts, one of whom, a well known gentleman of considerable scientific attainments, refused it at $25,000. The preseut superintendent (who, though a miner and metallurgist, does not, I believe, claim to be a geologist to any alarming extent) took it in at $113,000—thought he had a good bargain then, and knows it now. In oue respect, however, it seems that even Mr. Thomas was imposed on. He bought the property as a copper mine, aud now he finds that it is a silver mine also. Such instances of fraud might he more frequent without discouraging the doughty capitalists of New York.

I shall not attempt a description of the mines further than to say there is a very large quantity of very good ore in sight. The question as to whether they have an enormous vein, a group of large veins, or simply an immense deposit of ore without a true vein, is one which the future must answer.

The Ores

Are exceptioually free from arsenic and antimony, carrying merely a trace of the first, and, so far as I know or hear, not even a trace of the second. The mines on the south side of the canyon are partly in "oxysulphide" ore, and in one shaft in the old workings they got into calchopyrite; yet there is on this side a very large quantity, I should think thousands of tons, of oxidized ore, while on the north side, where the country is less compact, they are extracting oxides and carbonates from a depth of 100 feet, while the dryness of the ground and the existeuce of wide and deep crevices, or perhaps I ought to say "crevasses," insure a continuance of the same for at least another 100 feet in depth.

They Have One Furnace,

Which, with its appurtances, cost ahout $20,000. They smelt from 40 to 50 tons of ore per day's run, keeping the furnace fully supplied, and were accumulating ore on the dump without the necessity of stoping. With the exception of a little limestone, nothing but ore and coke goes into the feed hole. The slag runs like water, and the metal, of which they produce from 6 to 8 tons to the day's run, contains about 97 per cent. of copper, and from 300 to 600 ounces of silver to the ton. The profit on such a day's run is from $1,000 to $2,000. The only cause of delay of any consequeuce which has heen encouutered since starting has heen the want of coke, which will soon he remedied by putting more teams on the road. Another furnace is to be up next spring, which will bring the freighting husiness of the company up to a total of about 1,200 tons per month; besides which there will he all the business of the town, which is sure to grow in the vicinity of such a mine. This is a point for the projectors of, and objectors to, the railroad from Prescott to the A. and P. Great credit is due to Mr. Thomas for the energy and skill displayed in putting this property on a paying hasis. As he is understood to own a pretty fat slice of the stock, it may he hoped that his reward will he commensurate.

C. H. A.

Mexican Mines.

EDITORS PRESS:—I have frequently seen and read your illustrated paper, and under the head of "Mining Summary" I notice all mining localities and districts, hut seldom do I see much information as to mines in the Mexican republic. It is, however, a fact that a good many foreign interests are invested, with the most favorable results, in this country. The fact is, I suppose, that foreign interests in this country, productive as they may he, keep quiet, and do not wish to make it known to the world that they are in a well doing country.

The region here ahounds in mineral veins, which are laying idle, without enterprising capital to investigate their riches; although at present a good many foreigners, principally Americans, are looking into the wealth which surrounds us. Not alone is the mineral product attracting the attention of the world, but the agricultural and cattle lands of Mexico are being looked to. Enterprising people are taking hold of them, and they will greatly increase in value after the lapse of a few years. The country is virgin and abounds in all kiuds of materials and facilities—wood, water, telegraphic communications to all parts of the world, as well as ample wagon roads.

Speaking of this our mineral district, I have not the slightest hesitation in declaring that we have more personal security than even in your city. We have no such outrages, robberies, etc., in this country, such as I frequently see published in your San Francisco publications. Capital is secure to the utmost extent, and the authorities comply strictly to the laws. Foreign interest is respected and protected with great vigilance.

An American company, incorporated in your city—the Anglo-Mexican Mining and Land Company—established here lately within twelve miles of this town, is putting up reduction works of the capacity of fifty tons daily. It has oue of the grandest mining properties in this country—a mine newly discovered, of immense riches and fabulous quantity of ore. Such mines can he found in this country; aud I have no hesitation in referring to a property as large in quality and quantity in free-working ore as your Comstock vein of Virginia City, Nevada, at a distauce of ahout twelve miles from this town, and in close proximity to the mines helonging to the above named company. I will willingly give more particulars to parties wishing to enter or purchase a solid mining property.

The country is the healthiest in America. It was not until recently that we had severe attacks (at Mazatlan only) of bilious remittent fevers, which were mistaken there for yellow fever, which, until the present time, never prevailed here. At present the disease has nearly disappeared. It was dangerous only to the poorer class of people and the troops. The cause of the disease was, no douht, the increased heat during last month, without any any rain. The cool seasou has appeared, and no further fear as to sickness.

I could address you at greater length, but I fear to take up too much space; and I shall he ready always to give you and the public general views as to our country and its undeveloped wealth, should it he welcome.

BRUNO SYMANSKI.

Cosala, State of Sinaloa, Mexico.

FIFTY thousand francs is the prize which France offers for the discovery which shall enable electricity to be applied economically in one of the following directions: As a source of heat, of light, of chemical action, of mechanical power, as a means for the transmission of intelligence, or of the treatment of disease—the prize heing opeu to all nationalities, and to he awarded in December, 1887.

Trials of Rock Drills and Pulverizers.

The important trials, under the auspices of the Royal Cornwall Polytechnic Society, in which such general interest has heeu felt, having heen completed, the judges have made their report, giving at the same time such details as prove that they took every precaution to make the competitions reliable tests.

In pulverizers the competing machines were that of Messrs. Michell and Tregoning, of Redruth, that of Captain Nicholas, of West Basset mine, and that of Mr. Arunden Pryor, of St. Blazey Gate. Each in turn was worked hy the same steam eugine, and the coal consumed carefully weighed. The trial was, first, grinding hurnt leavings one hour each; and, secondly, grinding roughs one hour each. Before bruising the burnt leavings assayed 6 pounds of black tin per ton, and the roughs 2 pounds per ton, without the use of the hammer in the assays.

On the burnt leavings Messrs. Michell aud Tregoning's pulverizer, with a consumption of 1 cwt. of coal, pulverized 6 cwt. 2 qrs. 13 lhs. of stuff, so that 57 lhs. of hlack tin per ton could he washed therefrom without further bruising, equal on the quantity bruised to 19.25 lhs. of hlack tin. On the roughs, with a consumption of 2 qrs. 3 lhs. of coal, it pulverized 2 cwt. 3 qrs. 2 lbs., so that 16 lhs. per ton could he washed therefrom without further bruising, equal on the quantity ground to 2.2 lhs. of black tin. The work done by this pulverizer in the two trials was, therefore, sufficient to produce from 9 cwt. 1 qr. 15 lhs. of stuff 21.45 lbs. of black tin by the consumption 171 lbs. of coal.

Capt. Nicholas's pulverizer, on the burut leavings, hy a consumption of 3 qrs. 23 lhs. of coal, pulverized 7 cwt. 2 qrs. 12 lhs. of stuff, so that 41 lhs. of black tin per ton could he dressed therefrom, equal to 15.87 lhs. of hlack tin on the quantity hruised. On the roughs, this pulverizer, with a consumption of 2 qrs. 21 lhs. of coal, pulverized 3 cwt. 3 qrs. 10 lhs. of stuff, so that 16 lhs. of hlack tin per ton could be washed therefrom, equal to 3.1 lbs. on the quantity hruised. The work done hy this pulverizer in the two trials was, therefore, sufficient to produce from 11 cwt. 1 qr. 22 lhs. of stuff 18.97 lhs. of black tin, hy a consumption of 184 lhs. of coal.

Mr. Pryor's machine, on the burnt leavings, hy a consumption of 2 qrs. 21 lhs. of coal, pulverized 5 cwt. 1 qr. 15 lbs. of stuff, so that 19 lbs. of black tin per ton could be dressed therefrom, equal to 5.1 lbs. of hlack tin on the quantity ground. On the roughs, this machine, with a consumption of 21 lbs. of coal, pulverized 2 cwt. 2 qrs. 4 lbs. of stuff, so that 14 lhs. of hlack tin per ton could be washed therefrom, equal to 1.8 lb. of hlack tin on the quantity ground. The work done by this pulverizer in the two trials was, therefore, sufficient to produce from 7 cwt. 3 qrs. 19 lbs. of stuff 6.9 lhs. of black tin, by a consumption 98 lbs. of coal.

These results show that the quantity of tin obtainable hy the consumption of 1 lh. of coal was, in the case of Messrs. Michell & Tregoning's pulverizer, .125 lb.; Capt. Nicholas's pulverizer, .103 lh.; and Mr. Pryor's, .70 lb. The judges recommend to the general committee the award of their first silver medal to Messrs. Michell & Tregoning.

With regard to rock drills, the competing machines were the Excelsior, the Stephens and the Eclipse. An attempt was made to have the trial at Falmouth docks, with steam, but it was found that the pistons of the Elcelsior and Eclipse were too well fitted to their cylinders to run with steam, and the pipes for conveying the steam having proved defective, it was decided, through the kindness of Capt. Bishop, to transfer the trial from Falmouth docks to East Pool mine, in order that compressed air might be used, for which the machines are designed. At East Pool the test was speed in boring, each machine to hore one hole, in size equal to one-fourth of the area of its cylinder; each machine to use compressed air of the uniform pressure of 65 pounds per inch. The results were:

The Excelsior, 4-inch cylinder, commenced with a bit 2 1-16 inches in diameter, and hored 19 inches, when the hit was reduced to 1 11-32 inches. Another hit was then used, commencing at 1 9-16 inches, which, after horing 14½ inches, measured 1 3-16 inches. Total depth bored, 33½ inches, in 6 minutes 30 seconds.

Stephens's machine, 3½ in. cylinder, then commenced with a bit 1 25-32 in. in diameter, and bored 18 in., when the hit measured 1 18-32 in. A second bit was then used, commencing at 1 9-16 in., which, after boring 15½ in., measured 1¼ in. Total depth bored 33¾ in., in 5 min. 40 sec.

The Eclipse, 2½-in. cylinder, commenced with a hit 1 17-32 in. in diameter, and, after horing 13 in., measured 1 15-32 in. A second bit was then used, commencing at 1⅜ in., whicb, after horing 13¾ in., measured 1 5-16 in. Total depth hored 26½ in., in 6 min. 10 sec. The hole drilled hy the Eclipse was greater in area than one-fourth the cylinder, whilst the holes drilled by the Excelsior and Stephens were under the required size.

The rock cut hy each was: the Excelsior, 67 cubic inches; Stephens, 63.6 cubic inches, and the Eclipse, 41.7 cubic inches, equal to a hole of the specified ratio to the cyliuder of 21.33 inches in depth in the case of the Excelsior, 26.44 the Stephens, and 34 the Eclipse. The speed per minute at which each machine hored equal to a hole of one-fourth the area of its cylinder, was: the Eclipse, 5.51 in.; Stephens, the 4.67 in.; and the Excelsior, 3.28 in. The judges recommended to the General Committee of the Polytechnic the award of the first silver medal to the Eclipse for this competition. They also recommended the award of their first bronze medal to the Excelsior, not for its part in this contest, hut for the novelty of its principle, which is a valveless machine working expansively, aud out of which the mechanical judges hope to see further developmeuts.—*London Mining Journal.*

A Large Air Compressor.

The Plumas Eureka mine has in the course of erection a very large air compressor, to supply their increased demand for air power underground. This compressor was manufactured by the National Drill and Compressor Company, for their ageut, Edward A. Rix, Nos. 18 and 20 Fremont street, San Francisco. Next to the compressor at the Idaho mine, which is of the same make, it is the largest in the state. It is of the style called duplex, and consists of two long frames lying parallel with each other and about eight feet apart. On each frame is a 12″x15″ engine, which supplies the working power to compress the air in the air cylinders, which are fifteen inches diameter and thirty inches stroke, and holted to the same frame, directly in front of the steam cylinders. At the end of the frames, and joiuing them together, is the large shaft, having the cranks ou each end at right angles to each other. On the center of the shaft a six-ton fly-wheel gives equilibrium to all the movements. The usual water-cooling arrangements are attached to the air cylinders. This compressor is arranged to he driven with water power, also, and is accomplished hy haviug grooves on the rim of the fly-wheel to accommodate four two-inch hemp cables, which run over a pinion on the shaft of an eight-foot Knight water-wheel working under a 750-foot pressure. The compressor is so arranged that all the parts pertaining to the engine are simply disconnected, and the machine is ready to run hy water power without running auy of the steam gearing. This system of compressing air on the duplex system is coming into very general use, Mr. Rix having furnished quite a number of mines with these machines. The time has gone by when mine owners could neglect the cost of their wood-pile, and it now forms an importani item. The Duplex National Compressor, arranged with Meyers' cut-off on each steam cylinder, with the cranks at right angles, so that the right-hand steam cylinder drives the left-hand air cylinder, and vice versa, is claimed to be the most economical compressor yet made, and Mr. Rix says it is simply impossihle for any compressor driven hy a single engine, no matter how economical a valve-gearing it has, to compete with it in economy of fuel, taking into full consideration the amount of compressed air delivered. The machine is automatic. It maintaius a continuous pressure ou the air receiver, and slows itself down, stopping when the air is not being used. It will start itself instantly, after resting an hour or longer, the moment the consumption of air takes place. It requires no attention from the engineer heyond keeping the lubricating cups supplied, and keeping it clean. Mr. Rix will have another large duplex here shortly, and it is worth any mine owner's time and attention to examine the same. The smaller sizes he has in stock most all the time.

The Iron Mine.

The operations of the Iron Company at Hotaling are growing in importance, and are being conducted on a big scale. The number of men engaged at the furnace, mining out the ore, hurning charcoal, cutting timber, teaming, and in other ways connected with the business, number well up towards 300. Teams are constantly engaged in hauling pig iron to the railroad station at Clipper Gap, three and one-half miles distant, where hetween 7,000 and 8,000 tons are now piled up awaiting shipment. These huge piles of metal never fail to attract the attention of passengers on passing railroad trains, who, by this means, gain some idea of the importance of this new industry in the foothills. A survey of a new railroad route has heen made between Clipper Gap and Hotaling, hut whether the road is soon to he undertaken is not yet aunouuced; but that it will become a necessary adjunct to the business there is no douht. The company has recently hought large tracts of land from the Central Pacific Railroad Company, for the purpose of obtaining wood to hurn for charcoal, and has also hought a great deal of standing timber from the individual owners on hoth sides of Bear River. The consumption of timher for the kilns is enormous, all kinds being used in making charcoal, and in a few years the country around Hotaling for miles will be divested of its timher. The product of iron of the furnace is of a superior quality, and now has preference over any hrought to the Coast. The Central Pacific Railroad Company uses it quite extensively, taking regularly 200 tons a month for making car wheels and other work. It would seems as if at no distant day rolling mills will be established at Hotaling, and that it is not improhable that it will become a place of no little importance in the manufacture of iron ware.—*Placer Times.*

MECHANICAL PROGRESS.

American Mechanical Progress.

Some facts connected with the manufacture of wagons, carriages, agricultural implements, and tools, and machinery generally, in this country, says the *Blacksmith and Wheelwright*, exhibit in a very impressive form the vast progress which has been made in these industries during the last twenty-five years.

In 1860, a pleasure carriage of American make could not be found here. At that time we were obliged to import the springs and other steel work and most of the textile trimmings, but we now make the best quality of steel here, and also manufacture our own tassels, silks and fringes. It is said, that in the single state of Ohio we build in one year more pleasure carriages than are made in Great Britain and France combined. In 1880, there were in this country 43,000 establishments devoted to smithing and carriage-making, and the 105,000 hands employed in these workshops received in wages more than $38,000,000.

This remarkable progress is, of course, due chiefly to the skill and ingenuity of American mechanics and inventors, as shown not alone in the production of new labor-saving machinery, but also in making more effective certain tools common in most parts of the world, the heirlooms of ages, yet passing down to us through countless centuries, unchanged and unimproved, until American mechanics took them in hand. The result of this is that now, generally speaking, in durability, effectiveness and finish, American tools lead the world.

It was once supposed that no good cutlery could be made outside of Sheffield, but now, it is said that some of the manufacturers of that town endeavor to make their ware more salable by imitating the trademark of American makers. Our hand and circular saws are exported to all parts of the world, and in quality are not equaled by those of any other nation. In bronzed iron and brass articles, carpenters' and coopers' tools, molding and machine knives, tiles, etc., this country has nothing to fear from foreign competition.

Yet, this progress has been achieved in the face of formidable obstacles, chief among which may be mentioned the high price of labor and the raw materials. For years iron and steel have been sold here at rates enormously above those of other countries, and the consequence has been the handicapping of many of our most important industries. But these days have passed. Iron and steel are now much lower, and though the cheapening process has brought disaster to some of those who were interested in the production of these metals, there can be no doubt of the substantial advantage which will thus accrue to that much larger class of workers who fashion the raw material into articles of beauty or utility.

Styrian Tool Steel.

The iron ores of Styria are renowned for their purity, and are remarkable for the high percentage of manganese they contain. Hence the extraordinary character of the samples of Styrian tool steel which were shown at the late Engineering Exhibition by Messrs. Bohler & Bros., an Austrian firm, who exhibited a most interesting stand, where were several cases containing fractures of Styrian tool steel in ingots and bars; samples of the ores from which the steel is made; fractures of Styrian puddled and refined forge steel, and puddled and refined iron, all in fractures; also several samples of forged bar crucible steel. The fractures presented a beautiful silky appearance, and disclosed a remarkably fine quality of metal.

It may be interesting to notice the very simple method of manufacture adopted in Styria. The process was, in fact, illustrated at Messrs. Bohler's stand, where they had a full-size model of a Styrian refining hearth, as used at Hollbammer, Kapfenburg. In producing it the ore is melted in the usual manner, and run into cakes instead of pigs, that form being the most suitable for subsequent treatment. The cake or pig iron is then broken into pieces of a suitable size, and held by large tongs in the fire of the refinery forge, where it is brought down to a shapeless lump in the well of the forge. At this point of the process the Styrians claim to obtain a result that is nowhere else achieved, namely, that after the pig has run into the lump it is then refined steel, which is really shown to be the case by the direct method. This fact is due to the almost entire absence of any deleterious matter in the ore, to the high percentage of manganese it contains, and to the carbonization by the fuel, which we need hardly say is entirely charcoal. The lump is then cut into pieces, and drawn into rough bars under tilt hammers. The bars are then broken up into suitable lengths for melting in crucibles. When melted, the metal is run into ingots weighing from half a hundredweight to nearly half a ton each. The ingots are then heated and worked up into bars under tilt hammers, the result being a very high-class tool steel.

The Messrs. Bohler also produce a self-hardening steel, so called because it is naturally so hard that it does not require tempering. It is, in fact, a kind of natural steel, and possesses remarkable cutting power, combining, with its natural hardness, toughness and regularity of quality and temper. It is in use by some well known English firms, with extraordinary results. In one case it planed some switches and crossings the rails of which had defied all other brands of steel. In another instance one tool, made from 1¼-inch square self-hardening steel, bored out 300 steel tires, at a reduction in length by grinding of ¾ inch.

Temperature in Finishing Rails.

M. Gazan, a manufacturing engineer, referring to an opinion, expressed at a recent meeting of the Iron and Steel Institute, that "the chemical composition of steel has only a secondary influence upon the resistance of rails, every thing depending upon the temperature at which they are finished in the rolling mill," confirms this conclusion, and states from his own experience that bars which were finished at a bright-red heat (and which were recognizable after cooling by their blue tint) were more fragile under tests by striking or flexion than those finished at a lower temperature, which are covered in cooling by a layer of reddish oxide. In the first case the fracture presented a crystalloid and in the second an amorphous structure. It is his opinion that at a bright-red temperature the particles of iron have sufficient liberty of movement to allow of their grouping themselves into the crystalline form, which is not the case at lower temperatures, and that, consequently, if bright-red iron be subjected to mechanical work (such as forging and rolling) until it has cooled down it will have no opportunity of crystallizing.

In regard to the above the *Iron Age* remarks, that, while admitting the pernicious influence of overheating, it is hardly prepared to admit that the chemical composition of the steel has only a secondary influence upon the physical qualities of the product. There is no doubt that the best kind of steel may be ruined by burning or cold finishing, but certainly thus far no method of heating and rolling has yet been suggested by which as good rails could be made out of poor or unsuitable steel. As long as this is the case, it is idle to talk about chemical compositions being a secondary consideration. Quality of the ore, of the pig, of the spiegel—in a word, of each ingredient which enters into the composition of steel, are all determined by chemical analysis, and are selected with a view to the production, from the ratios of their constituents, of the material most suitable for the purpose for which it is designed. No doubt mechanical manipulation exerts a great influence, but this influence is, and always will be, secondary to chemical composition, until somebody shall succeed in making good steel from bad iron.

In regard to M. Gazan's temperature observations, *i. e.*, the points where the structure of the metal will change from the amorphous to the crystalloid, we must be permitted to say that his statement, while not lacking in precision, is decidedly incorrect. Unquestionably the change from the amorphous, wax-like structure to the crystalline (not crystalloid, but positively crystalline) is entirely dependent upon the temperature, but the degree of heat at which this change takes place is in inverse ratio to the carbon percentage; that is, the higher in carbon the lower the temperature at which the change will occur, and vice versa: and it is therefore that this change in iron corresponds to and is identical with the point of white heat, and not bright-red heat as M. Gazan claims to have observed. Heat observations in metallurgy require a very extended practice, and it is very probable that M. Gazan's otherwise valuable observations have been largely modified by defective vision.

DRIVING MACHINERY BY SAND.—An American paper gives an interesting account of the method recently adopted by Mr. J. Townsend, of Virginia City, to run a number of arrastras by sand. The arrastras are placed in a light sandy field, where only sufficient water for drinking purposes and to moisten the ore to be operated upon can be obtained. The sand drives a large overshot wheel, taking the place of water. It was at first Mr. Townsend's intention to run the arrastras by means of a large windmill, but as the speed was naturally irregular, he adopted the present method. The windmill now runs a belt containing a number of buckets, and these carry sand up to a large tank, somewhat in the way that grain elevators carry wheat. A stream of sand being let out upon the overshot wheel causes it to revolve, just as it would under the weight of a stream of water, and thus far the method is said to have been found very successful. When there is a considerable wind, sand is stored up for use when calms prevail, and in this manner the mills may run continuously.

IRON PAINT.—Iron paint, as it is termed—a paint composed of pulverized iron and linseed oil varnish—is a recent German invention, and is intended for covering damp walls, outer walls, and in short any place or vessel exposed to the action of the open air and to the weather. Should the article to be painted be exposed to frequent changes of temperature, linseed oil varnish and amber varnish are mixed with the paint intended for the first two coats, without the addition of any artificial drying medium. The first coat is applied rather thin, the second a little thicker, and the last in a rather fluid state. The paint is equally adapted as weather-proof coating for wood, stone and iron; nor is it necessary to previously free the latter from rust, grease, etc., a superficial cleaning being sufficient.

SCIENTIFIC PROGRESS.

An Unrecognized Possible Cause of Boiler Explosions.

M. Vignes, in the *Journal La France*, draws attention to experiments made as long ago as 1846, by Professor Donny, of Ghent, and intended to show the influence which air exercises on the boiling point of water, and on the character of its ebullition. In this experiment ordinary water is placed in a clean glass tube, open at one end, and boiled long enough to drive away not only the air above the surface of the water, but all the air dissolved in the water. Then, when the upper part of the tube is full of pure steam, the mouth is hermetically sealed, and the tube is left to cool. When cool, it is about half full of water, above which is vapor of water at a very low pressure. The tube being thus prepared, its lower end is plunged in a bath of glycerine or oil, which is gradually heated. No ebullition is visible in the tube when the temperature reaches 234° F. At 240° F., however, the column of water bursts, as it were, in two, with a sudden explosion, and part of it is flung against the sealed end with such force as often to break it open.

Now, in industrial works, it often happens that a boiler, having been filled with water, works for three or four hours without receiving a further supply. It may then be cooled down, and the next time it is wanted it may very probably be fired up again without starting the feed pump, the water level being judged sufficiently high. But the water in such a boiler will be in the same condition as that in the test tube; *e. i.*, it will be deprived of all air, and consist of water below and vapor above, the latter, however, being probably at a much higher pressure than that of the water in the tube. This water has no free surfaces in its interior, due to the presence of bubbles of air, from which evaporation can take place. Consequently, as in the test tube, there will be delay in vaporizing, at least until the expansion becomes great enough to overcome the pressure of the superincumbent vapor, and a sudden flashing into steam, which will be of the nature of an explosion, and may easily overcome the resistance of the boiler.

The pressure thus attained may be very great. In the test tube the pressure of the temperature of explosion, 240° F., will be 86 times what may be taken as the pressure of the superincumbent vapor in the boiler, as already observed. That pressure will probably be much higher, and the pressure of the explosion will probably be much higher also. To avoid this source of danger, it will be sufficient, as M. Vignes points out, to make it a rule always to feed a boiler when it is fired up after standing. This will have the double effect of lowering the pressure and of facilitating evaporation, by distributing the mass of water in the boiler and charging it to some extent with bubbles of air. Meanwhile the facts he has adduced are certainly sufficient to warrant a belief that we have here a key to many cases of boiler explosions which have hitherto been wrapped in mystery, and it seems very desirable that careful and precise experiments should be undertaken to prove or disprove the production, on a large scale, of the phenomena thus shown to exist in laboratory experiments.

Stone Implements.

In an essay upon the use of stone implements by ancient races, a German author submits some interesting observations to prove the existence of their use during the periods when metal began to come into use as a material for weapons and tools. Stone implements were employed by nations at a time when they were well acquainted with the preparation of the hard metals. Thus, the Egyptians used flint chisels and granite sledges in the quarries of Mt. Sinai. In the excavations at Syene stone tools have been found. The Romans used stone chisels in the gold mines of upper Egypt. The Assyrians at the zenith of their power used stone axes along with metallic weapons. The Chinese were armed with stone weapons when they (2200 B. C.) descended upon the plains and subjugated a race using metals. The Mexicans have wrought delicate sculptures on stone with stone implements. In the mines of Spain and Sardinia stone hammers were in use during historic times.

Many reasons explain these survivals. Conservative habits prolong the use of old and valued tools. Religious ceremonies connected with their use, as the acts of embalming among the Egyptians, circumcision with the Jews, sacrificial knives with the Phœnicians and Etruscans, maintained the employment of stone in such rites from traditional and reverent motives. Again, the poorer classes could not afford the purchase of the new and dearer implements, and used the older and cheaper material for the construction of their tools. The new metallic objects were probably not always able to replace in efficiency their stone counterparts. Workmen were more expert in the use of the stone than the metallic implements.

Again, linguistic evidence supports these conclusions. The Basque names for weapons and tools imply the use of stone; ax is a "big stone," hoe a "scraping stone," knife a "little stone," or "stone chip." The holy spear of India is named Akman; *i. e.*, "sling stone, thunderbolt." The god Thor is armed with a stone sledge. Our word "hammer" meant originally "stone, cliff," and later acquired the associated idea of "a stone to strike with." The German word *messer* originally meant *ess stein*; *i. e.*, "eating stone." *Hellebarte*, English halberd, meant "beard-shaped stone," stone ax. In the Indian and German myths, stone weapons take an important place; from which the author concludes that these peoples had reached the advanced stage of mental development implied in these legends and stories before their chiefs and heroes had replaced their stone with metal weapons.

On the other hand, the races of Southern Europe describe the heroes of their myths as fighting with metal armor only, which implies the origin of these tales at a time when the preparation of metal and the manufacture of metal weapons were understood. The same inference is drawn with regard to the Semito-Hamitic races. From these examples it is clear that the Stone Age with different races did not correspond to any identical and prevalent condition of culture, but varied, as might have been pre-supposed, according to the varied and opposite conditions by which they were surrounded. And it also plainly is seen that the Stone Age itself but slowly yielded before the encroachment of its modern successor.

A Self-Registering Ships' Compass.

Mr. Robert Pickwell, civil engineer, of Hull, England, has introduced an ingenious self-registering ships' compass invention capable of adaptation to every description of ships' compasses. It is at the same time so simple in construction, and supplies so infallible a check upon the movements of the man at the steering-wheel, that it can hardly fail, when it becomes generally known, to be regarded as an indispensable equipment to the safety of every seagoing vessel. Even if quartermasters and their subordinates, when directing the ship's course, may not be guilty of wanton carelessness, they are not always exempt from the risk of involuntary error in their reckoning. They may be overtaken in a fog, and a collision may occur. Although the captain himself may be a competent and experienced seaman, he may be navigating a coast to which he has previously been a stranger, or entering a foreign harbor by tortuous windings beset with shoals and quicksands, not very distinctly laid down in any chart, and both in a storm or in a calm he may have the misfortune to run ashore. The underwriters, by whom the ship is insured, and his owners, are alike interested in obtaining the most accurate information possible as to the position of the vessel's head at the moment of disaster. By no contrivance previously known has this much-desiderated information been attainable. But by the device of Mr. Pickwell, the direction taken may be indicated with unerring exactness at every moment throughout the entire voyage.

The arrangement is automatic. The length of time the ship has kept on any course is automatically photographed. Every alteration in the course, and the exact time when any change in the direction has taken place, are also registered to a nicety. The diagrams are accessible for reference at all times, and can be removed and filed every twenty-four hours, or oftener if desired. Each diagram is produced by a ray of either daylight or lamplight projected through an orifice in the compass-card to a prepared paper surface underneath.

DEPTH OF ICE DURING THE GLACIAL AGE.—Mr. G. W. Wright, in a communication to *Science*, says that the evidences of glaciation are distinct upon the Green Mountains to a height of nearly 5,000 feet. The lower summits of the White Mountains, like Carrigain, which is 4,300 feet above the sea, are covered with transported bowlders; and there can be little question that some found by Prof. Charles Hitchcock, within a few hundred feet of the summit of Mount Washington, were transported thither by glacial agency. Such is the evidence for New England. For the region north of Pennsylvania and the Ohio River, direct evidence of such a great depth of ice is naturally wanting; but, according to Ramsay, glacial scratches are numerous upon the summit of Catskill Mountains in New York, at an elevation of 2,850 feet above the sea. In southern Ohio there are numerous places where the ice, within a mile or two of its farthest extension, surmounted elevations which are about 500 feet higher than the plains to the north of them. I see no reason why it should not have been as deep over Lake Erie as over the region to the north of the White Mountains, though there are no glacio-meters like Mount Washington to measure the height of the frozen mass.

DETECTION OF WOOD FIBERS IN PAPER. As wood changes under the influence of the air, growing brown and consequently diminishing the durability of the paper in which it has been employed, it is of great importance, both for the dealer and for the consumer, to be able to ascertain whether a given sample of paper contains woody fibers or not. For this purpose a solution of sulphate of aniline, or a mixture of one part sulphuric acid and three parts nitric acid may be employed. Either of these solutions produces immediately a yellow color upon the paper if it contains wood, the depth of the yellow shade increasing as the proportion of wood increases.—*Chron. Industr.*

MINING SHAREHOLDERS' DIRECTORY.

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ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'ST.	SALE.	SECRETARY.	PLACE OF BUSINESS
Best & Belcher M Co	Nevada	27	50	Sept 18	Oct 24	Nov 16	William Willis	309 Montgomery st
Benton Con M Co	Nevada	11	10	Nov 1	Dec 6	Dec 24	W H Watson	302 Montgomery st
Buena Vista Petroleum Co	California	31	25	Oct 30	Dec 5	Dec 27	L Kennann	220 Sansome st
California M Co	Nevada	9	20	Oct 1	Nov 7	Dec 5	C P Gordon	309 California st
Champion M Co	California	13	10	Oct 8	Nov 15	Dec 8	Theo Wetzel	322 Montgomery st
Con Amador M Co	Nevada	6	50	Sept 15	Oct 20	Nov 13	F B Latham	408 California st
Campo Seco Copper Co	California	2	10	Aug 10	Oct 1	Nov 20	D Buck	309 Montgomery st
Day S M Co	Nevada	13	30	Sept 7	Oct 15	Nov 12	E M Hall	327 Pine st
Elko Con M Co	Nevada	2	15	Oct 6	Nov 12	Dec 4	F Sperling	309 California st
Eureka Con M Co	Nevada	7	10	Sept 27	Nov 10	Nov 30	A F Main	418 Jackson st
Eintracht Gravel M Co	California	13	05	Sept 11	Oct 17	Nov 5	H Kunz	209 Sansome st
Eureka Con M Co	Nevada	6	1.00	Sept 23	Oct 22	Nov 12	P Jacobus	309 Montgomery st
Henrietta Gravel M Co	California	7	02	Oct 23	Nov 23	Dec 14	L Gross	530 Washington st
Mayflower M Co	California	20	15	Oct 4	Nov 6	Nov 22	J Morizio	328 Montgomery st
Martin White M Co	Nevada	16	25	Sept 22	Nov 7	Dec 6	J J Scoville	309 Montgomery st
McElroy Gravel M Co	California	11	25	Oct 25	Nov 30	Dec 26	J T Fogarty	806 Montgomery st
Mexican M Co	Nevada	24	1.00	Sept 17	Oct 23	Nov 13	C L McCoy	309 Montgomery st
Ruby Hill Gravel M Co	California	9	25	Sept 3	Oct 20	Nov 12	H Pechan	220 Sansome st
Savage M Co	Nevada	27	50	Nov 3	Dec 7	Dec 27	E B Holmes	309 Montgomery st
Union Con M Co	Nevada	24	50	Oct 15	Nov 20	Dec 11	J M Buffington	309 California st
Utah S M Co	Nevada	46	1.00	Oct 11	Nov 16	Dec 3	G C Pratt	309 Montgomery st
Winthrop M Co	California	1	25	Sept 17	Oct 23	Nov 16	H Wright	410 Front st
Yaqui M Co	Mexico	2	10	Sept 12	Oct 17	Nov 7	T T Atkinson	337 Pine st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Bodie Tunnel Co	California	C C Harvey	309 California st	Annual	Nov 12
Challenge Con M Co	California	W E Dean	309 Montgomery st	Annual	Nov 15
East Mt Diablo M Co	California	G W Fisher	306 Pine st	Annual	Nov 7
Little Chief M Co		S C Dean	22 California st	Annual	Nov 12
Peck M Co	Arizona	C T Budge	224 California st	Annual	Nov 15
Hamburg M Co		D A Jennings	409 California st	Annual	Nov 13
Yreka G Co	California	C V Manner	50 Front st	Annual	Nov 15

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Bulwer Con M Co	California	W Willis	309 Montgomery st	15	July 2
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	July 19
Mt Diablo M Co	Nevada	R W Heath	318 Pine st	25	Oct 25
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	Nov 12
Silver King M Co	Arizona	J Nash	315 California st	25	July 12

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Oct. 17.		WEEK ENDING Oct. 24.		WEEK ENDING Oct. 31.		WEEK ENDING Nov. 7.	
Alpha	2.10	2.50	2.10	2.15	1.90	2.00	1.75	1.90
Alta	1.40	1.60	1.25	1.55	1.30	1.60	1.30	1.65
Andes	.55	.60	....	.55	.65	.70	.65	.70
Albion	....	....	....	....	....	.40	....	.40
Argenta	.15	.40	.15	.20	.15	.20	....	....
Atlas	....	....	....	....	....	....	....	....
Belcher	1.20	1.45	1.10	1.25	1.00	1.15	....	....
Belding	....	....	....	....	....	....	....	....
Best & Belcher	3.10	3.90	3.65	4.00	3.60	3.90	3.60	3.85
Bullion	.80	1.00	....	.90	....	.85	.65	.66
Bechtel	....	....	....	....	....	....	....	....
Belle Isle	.40	.50	.40	.50	.40	.45	....	.45
Bodie Con	.40	.70	.50	.65	.25	.40	.30	.40
Benton	.20	.25	.15	.20	.15	.20	....	.15
Bodie Tunnel	....	....	....	....	....	.10	....	.05
Caledonia	....	....	....	.15	....	.15	....	....
California	.15	.20	.10	.20	....	.10	.25	.30
Challenge	....	.35	....	.35	....	.35	....	....
Chollar	2.30	3.00	2.25	2.70	2.25	2.40	2.05	2.35
Confidence	....	....	1.60	1.75	....	....	1.50	1.76
Con. Imperial	....	.10	....	....	....	....	....	.05
Con. Virginia	.50	.60	.45	.60	.45	.55	.45	.50
Crown Point	1.20	1.40	1.20	1.30	....	1.20	1.05	1 10
Day	....	....	....	....	....	....	....	....
Elko Con	....	....	....	....	....	....	....	....
Eureka Con	4.50	5.00	4.25	5.00	4.15	2.25	4.00	5.00
Eureka Tunnel	....	.15	....	.10	.05	.10	.05	.10
Exchequer	.50	.65	.40	.55	.40	.50	.40	.45
Grand Prize	.50	.55	.50	.55	.45	.65	.45	.60
Gould & Curry	2.10	2.35	1.75	2.55	1.80	2.00	1.70	1.90
Hale & Norcross	2.25	3.85	2.30	2.80	2.00	2.40	1.70	2.25
Holmes	....	....	....	....	....	....	....	.20
Independence	....	....	.40	.45	....	....	.35	.40
Julia	....	.05	....	....	....	.05	....	.05
Justice	.40	.45	.25	.40	.25	.35	.25	.30
Jackson	....	....	....	....	....	....	....	.50
Kentuck	....	....	....	....	....	....	....	2.00
Martin White	....	....	....	....	....	.25	....	....
Mono	....	....	....	....	....	....	....	....
Mexican	2.25	2.70	3.20	3.50	3.05	3.35	3.00	3.30
Mt. Diablo	4.00	4.50	....	4.00	....	4.00	....	4.00
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	....	....	....	....	....	....	....	....
Northern Belle	5.00	5½	4.00	4.25	....	4.25	4.00	4 25
North Noonday	....	....	....	....	....	....	....	....
Navajo	3.25	4.50	4.10	4.80	3.35	3.65	3.05	3.95
North Belle Isle	.40	.70	.60	.65	.55	.60	.50	.55
Occidental	1.50	1.60	1.10	1.50	1.00	1.40	....	1.40
Ophir	4.55	6.75	5.50	5½	5.75	5½	4 80	5½
Overman	....	.40	.35	.40	....	.30	.25	.30
Oro	....	....	....	....	....	....	....	....
Potosi	.90	1.15	.90	1.05	.85	.95	.75	.90
Pinal Con	....	....	....	....	....	....	....	....
Savage	1.10	1.50	1.00	1.25	.85	.95	.60	.90
Seg. Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	4.15	4.60	3.65	4.25	3.65	4.00	3.8	4.15
Silver Hill	....	....	....	.10	....	.05	....	....
Silver King	....	....	....	7.50	....	8.00	....	.1
Scorpion	.60	.65	.50	.60	....	.50	....	.50
Tuscarora	....	....	....	....	....	....	....	....
Union Con	3.85	4.20	3.50	3.90	3.55	3.70	3.55	3.80
Utah	1.90	2.40	1.60	1.90	1.70	1.80	1.40	1.70
Ward	....	....	....	....	....	....	....	....
Wales	....	....	....	....	....	....	....	....
Yellow Jacket	3.25	4.00	3.15	3.40	3.30	3.50	3.05	3.35

Sales at San Francisco Stock Exchange.

THURSDAY A. M., Nov. 8.

200	Alta	1.35	
450	B. & Belcher	3.55	
100	Bodie Con	30c	
50	Bullion	55c	
100	California	25c	
375	Chollar	2@2.05	
1350	Con. Virginia	45c	
50	Day	40c	
115	Eureka Con	4.10	
310	Hale & Nor	1.75@1.80	
150	Mexican	2.80@2.75	
200	Gould & Curry	1.50	
50	Navajo	3.90	
220	Ophir	3.60	
100	Overman	20c	
140	Potosi	70c	
420	Savage	65@70c	
180	Scorpion	50c	
120	Sierra Nevada	3.85	
20	Utah	1.45	
100	Union Con	3.55@3.60	
200	Yellow Jacket	3.15	

AFTERNOON SESSION.

45	Eureka Con	4	
50	Belmont	2.75	
155	G Prize	25c	
400	Elko Con	20c	
200	Bodie	30c	
80	Ophir	3@3.60	
150	Mexican	2.70@2.75	
50	Gould & Curry	1.50	
340	Chollar	2@2.05	
1200	Con. Virginia	40@45c	
100	Hale & Nor	1.70@1.75	
100	Crown Point	1	
100	Alpha	1.65	
100	Belcher	90c	
50	Confidence	1.60	
70	Sierra Nevada	3.80@3.85	
100	Best & B	3 45	
250	Exchequer	40c	
300	Justice	25c	
300	Alta	1.35	
10	Union C	3.55	
100	Occidental	1@1.20	
100	Andes	50c	
150	Scorpion	50c	
10	Utah	1.40	
200	Benton	15c	

A GENTLEMAN who has passed a year and a half in the interior of Alaska, and has just returned, declares that the temper of the natives is such that there is certain to be a disastrous outbreak before many months, which will result in the massacre of the whites at the mining camps and stations. The power of the government he believes to be entirely inadequate to preserve order or control the natives so long as but one vessel is kept on that coast.

THE November peach is in market in Southern California.

Mining Share Market.

Transactions in the Mining Share Market of late have been on a very small scale indeed. The brokers are far from doing a thriving business, for what few dealers there are do very little dealing compared to what was formerly the case. Up on the Comstock the Ophir is extracting a considerable amount of low-grade ore from the 150 level. This is principally old fillings. Between the 150 and 500 levels it is expected that ore in new ground will be found. At the Hale and Norcross the east crosscut from the north drift on the 2700 level is developing some good ore, and the indications are of a promising character. The south drift on the same level is in vein material that promises well. At Gold Hill the leading companies are now taking out a considerable amount of low-grade ore from the old upper levels. The Alta folks will now soon be in a position to resume active prospecting operations.

Bullion Shipments.

Hanauer, October 30, $5,350; Stormont, 30, $2,900; Ontario, 30, $12,709; Horn Silver, 30, $12,000; Vienna, 30, $1,622; Alta, 31, $12,963; Horn Silver, 30, $12,100; Hanauer, Nov. 2, $4,345; Bullionville, 2, $2,562; Horn Silver, 2, $12,000; Vienna, 2, $1,745; Ontario, 2, $5,101; Horn Silver, 3, $12,000; Ontario, 3, $5,009; Alice, 4, $11,371; Crescent, 4, $2,020; Hanauer, 4, $4,860; Bullionville, 4, $2,676; Vienna, 4, $1,755; Ontario, 4, $4,760; Horn Silver, 4, $12,000; Alhambra, Oct. 29, $11,371; Contention Con. (for Sept.), $72,000; Bodie, 5, $10,709; Northern Belle, 29, $7,425; Standard, 29, $17,025; Contention, Nov. 2, $16,259; Mt. Diablo (for Oct.), $47,109.

A PROJECT is on foot to build three more railroads in this State, the survey for one having already been commenced. This one will be an extension of the road at present running from Marysville to Oroville. It will be extended from the latter town to Big Meadows, Plumas County. The second road will extend from Rocklin, on the Central Pacific railroad, to what is known as The Bridge, thence to Cooperstown Ravine, then through Greenwood and Georgetown to Forney's, thus opening up a large fruit district. The third projected route will extend from Napa to Berryessa Valley, from which Lake County is easily reached. This road is to be constructed so as to connect Berryessa Valley with Napa, thus giving it an outlet to the bay.

SULLIVAN'S PROSPECTING DRILL.—In the PRESS recently we illustrated and described the Sullivan prospecting drill lately introduced here by the Berry & Place Machine Co. We have heard since that one of these drills being worked for Mr. Osgood, of Denver, has got down a hole more than 1,000 feet, with the loss of but a single castor. He expects to go several hundred feet deeper. He has been using the same sized drill-tubing, and had no delays in any way from the machine.

THE United States Supreme Court has decided that self-killing by an insane person understanding the physical nature and consequences of his act, but not its moral aspect, is not death by suicide within the meaning of the condition in the policy of insurance upon his life; that the policy shall be void in case he should die by suicide.

MARQUIS TSENG says China is amply able to care for all Chinese interests, and China intends to fully do it. He thinks the danger of war is rapidly increasing.

IF YOU don't want to freeze when it's cold, suffer from excessive perspiration when it's warm, use Brown's Iron Bitters.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

MAMMOTH.—*Ledger*, Nov. 3: The Mammoth is 3 miles south of Jackson, at the southern extremity of the main quartz belt that runs through Amador County. There is but 1 shaft, which is less than 200 ft deep. From this a drift has been run north, which, after penetrating the footwall, encountered a body of quartz, which is not only of high-grade throughout but contains a vein of free gold, which has been followed 100 ft, and from which many thousands of dollars in gold have been taken. At another point a vein of metal was struck 50 ft from the surface. This seam varied from 3 inches to a foot in width. In less than a week between 2 and 3 tons of ore were taken out, which contained $75,000 in gold. This deposit was left unexhausted, on account of bad air. The work now consists in running a tunnel from the sidehill to tap the shaft below the present level. This tunnel is being pushed rapidly, and not more than 200 ft remains to reach underneath the shaft. Only 1 crushing of ore from the general ledge has been made, which yielded an average of over $100 per ton.

MIDDLE BAR TUNNEL.—The big tunnel at Middle Bar is now in over 200 ft. The water supply is sufficient to run the air compressor to its full capacity. Three shifts of 8 hours each keep the work moving. One body of quartz, several feet in width, has already been cut. The face of the tunnel is again in hard rock.

SUTTER CREEK.—*Sentinel*, Oct. 31: Alvinza Hayward is reported to have secured control of the Seaton mine of Drytown. Judge Moore and A. Caminetti are confident that in the Wetzler mine they have prospects of an enormous fortune. A small seam of quartz of some value was cut through in the Nevills' mine tunnel the other day. This is a foretaste of what may be struck before the tunnel, which is now in over 100 ft, reaches the ground under Jackson. A little less than $13,000 was the amount realized from a week's run of 5-stamps at the Iowa mine, and there is more in sight. The Zeile hoisting works are to be raised higher in the air, with the object of giving the mine-building more storage capacity. The 40 stamps of the mill have been running lately by steam. A number of men were set at work Monday repairing the Amador Con. mill.

Calaveras.

MURPHY'S.—Cor. of *Citizen*, Nov. 3, The Haggin mine, at Sheep Ranch, which has been worked for years, is still being worked successfully. One of the discharged employees informed me that he had an intimate knowledge of the lower levels of the mine, and in his opinion the mine never looked better than at present. The Calaveras, Washington and Wood mines all have merit. All the ore from them to the Oro Plata, which is in the immediate vicinity of Murphy's, are mining properties, that promise large returns. Nearly all the quartz in the mines mentioned is very similar to the quartz from the Haggin mine.

NOTES.—The Oro Plata Co.'s mill will start up again during the coming week. The one-stamper is running on ore from the Frazier mine. The rock is high grade.

SAN ANDREAS. The sinking of the shaft on the San Andreas gravel mine, which has been retarded on account of the workmen having had 40 ft of cemented gravel to contend with, is now being pushed ahead. During the forepart of the week a number of workmen have been moving the machinery from the old works to the new shaft. As yet they have not got down to "bed rock," but say "they are bound to strike it or dig out on the other side."

ANGELS' CAMP. *Mountain Echo*, Oct. 31: There has not been a time within the last fifteen years when the mining outlook in this section was more flattering than at present. Several quartz mills are ready to start, if water could be had, but are compelled to wait. Angels' will be a stirring camp in a few months.

El Dorado.

EUREKA. Georgetown *Gazette*, Nov. 2: The managers of the Eureka mine have decided to have a first-class 20-stamp mill put up on their mine, and have no more fooling with experiments. The work of putting up the new mill and machinery have been given to H. S. Morey, of the Placerville foundry. We learn that 10 stamps will be put in right away.

VOLCANOVILLE. From a clean-up of a few weeks run in the Flora (drift) gravel mine near Volcanoville, made a few days ago, over $3,000 was realized. This mine was purchased by Mr. R. G. Hart some 2 months ago.

STRIKE IN PLEASANT VALLEY. Placerville *Republican*, Nov. 1: Some very rich ore has been struck in the stope from the lower level in the mine, between $400 and $500 being obtained from the rock contained in 2 or 3 candle boxes.

ANOTHER GRAVEL MILL.—Capt. Ames has received part of the timbers for a gravel mill, which he intends to erect on his gravel claim on Chili ravine, near Coon Hollow.

THE DAVIDSON MINE.—Under the management of Peter Gross this mine continues to improve. Last Saturday they cleaned up over $8,000, having run 10 stamps for 25 days.

Inyo.

CLIFF MINE.—*Independent*, Oct. 27: We have specimens of silver ore from the Cliff mine, Deep Spring district, which assays $755 per ton, and which works to a little over $650 on an average. The vein is continuous, carrying not less than a 6-inch streak of just this kind of ore. The Cliff is the property of Messrs. Greenly and Broder. This is on Cottonwood Creek, not in Deep Spring proper, though covered by that district.

THE WAY TO DO IT.—The best method for reducing Inyo County ores is yet an unsolved problem. It may be set down as a settled fact that ordinary "free milling processes" won't do. More elaborate and expensive processes are not to be relied upon, except in exceptional instances. In the main, smelting is to do it. But most of our ores can not be handled in quantities in that way. We feel assured this question will be settled here, as it has been in Colorado and Montana. In the main, their plan is comprised in simply this: Concentrating and smelting. Special concentrating mills for custom work are becoming more and more common. They use crushers, not stamps, of great capacity, and concentrators, each of not less than 20 tons daily output, working to above 90 per cent of all minerals contained.

Mariposa.

BUENA VISTA. *Herald*, Nov. 2: Twenty-five ft from the surface a drift has been run east 105 ft on the vein, which shows a healthy body of ore. From the middle of this drift a *Herald* representative knocked off a piece of rock last Friday that showed considerable gold. A drift will be run east on the vein this winter at the 80-level, and sinking resumed in the shaft. Four miners are now at work. About 300 tons of ore that will probably work $15 to the ton is now on the dump.

MT. RAYMOND.—Messrs. Smith and Gann bonded the Willoughby mine to San Pedro until August, 1884, for $20,000, with the proviso that if the money is paid by the 1st day of January, 1884, they would accept $12,000 as payment in full for the mine. San Pedro is confident that he will pay for the mine on the 1st of January.

DILTZ MINE.—*Gazette*, Oct. 27: There is already upon the dumps, and in sight in the new shaft, milling ore that will yield at the lowest estimate $150,000.

Placer.

FOREST HILL.—*Argus*, Nov. 1: The upper part of the Forest Hill divide will be a lively mining region next year, judging by the accounts we hear, not only of the big prospects, but of the big pay in the new mines. Mining matters seem booming. The Mayflower Co. are making extensive improvements on their claim. They have just completed fine hoisting works, and are commencing a stamp-mill.

BATH.—*Herald*, Nov. 3: Breece & Wheeler, who for awhile lost the channel in their mine at Bath, have struck it again, and are now taking out pay as big as ever. All over the Forest Hill and Iowa Hill divides the mining outlook seems better than it has for years.

GOLDEN FLEECE.—We received a call Tuesday from Mr. Frederick Shermeir, of San Francisco, and E. Mortensen, of El Dorado. They were on their way to the Golden Fleece gravel mine, above Damascus, in this county. News had been sent to them that the main channel had been struck, and that the gravel paid well. These gentlemen informed us that pay had also been struck in the Hog's Back and the New Basil, other locations in the same neighborhood, which, like the Golden Fleece, have been boring into the earth for years in the expectation of striking the big blue-gravel channel.

Plumas.

GRANITE BASIN.—Greenville *Bulletin*, Oct. 31: The quartz mill of the Williams mine, at Granite Basin, has been moved up to the mouth of the tunnel at the mine. The ore had to be hauled over a bad road. Now the ore can be delivered in the mill direct from the mine, and steam power will permit of running at all seasons. There is an immense amount of ore in sight in the basin.

THE LOST LEAD.—When the rich lead of the Providence Hill gravel mine was lost effort was made to recover the lead, but without success. A few months ago John Ellis and Charley Bressler went to work, and are now very confident that they are on the right track. Should they be successful the activity of former days would soon be resumed along Rush creek.

EMERALD MINE.—Greenville *Bulletin:* The corporation is known as the Lucky S Gold Mining Co. Both the finds were on Saturday—hence the name Lucky S. The company own 1500 ft on ledge No. 1 and 3000 on No. 2, and its twin, the black ledge. Every practical quartz operator expressed the opinion that the two ledges will ultimately be found together and the walls filled with solid quartz. If such should prove to be the case, here is a show for the biggest and richest mine in Northern Plumas. A superficial cut has been made on the vein, 500 ft south of the shaft, exposing rock that a well known mining superintendent says will pay $100 to the ton.

San Bernardino.

ROCK POINT. Calico *Print*, Nov. 3: Operations have been resumed in this mine. A tunnel 165 ft in length has been driven in from the east side, running in the direction of the Silver King. Some of the ore will go $150 to the ton, but most is low-grade, averaging $40 to $50.

KEARSARGE.—A larger body of ore is in sight than there was a week ago. Within a width of a few feet several streaks varying from 3 inches to a foot can be traced in the sides and face of the opening. Besides the amount of dead work done they have taken out 1,000 pounds of very rich ore.

SAM HOUSTON, No. 2.—Messrs. Burch & Hutchins have leased the Sam Houston No. 2, and have indications of a fine mine. They have sunk a shaft 40 ft, and run a drift on the ledge to the north. In this drift they have uncovered a vein of ore a foot in width that is getting wider as they go down. Some very rich ore has been taken out; about a ton that is supposed by assays to be worth over $1,000.

Shasta.

SOUTH FORK.—Cor. *Courier*, Nov. 3: Shirland & Henneken have been extending the Continental tunnel and found some ore. Cooper & Smith are at work on their mine, and will start their arastra in a few days. E. L. Ballou's arastra is running on ore from his Manzanita mine. The mine is looking well. Crum's arastra is running on Pacific ore, very rich. Wright & Ormsby have their arastra completed and at work. The arastra has several improvements over the first constructed here. Some assessment work is being done on the Chicago, is extending the the working tunnel. Blank continues to turn out good work. Robinson & Co. have increased their pressure by adding more pipe. The last run averaged $24 a ton. The mine is looking well.

Sierra.

COLUMBO.—*Tribune*, Nov. 1: Everything is activity around the Columbo mine at Sierra City. Notwithstanding the short time since active operations were begun, a vast amount of work has been accomplished. The mill is well along toward, completion. J. P. Deidesheimer is personally supervising the work.

MARGUERITE.—At the Marguerite mine, men are grading for a flume and excavating a tail-race for a turbine water wheel. The flume will be about one-quarter of a mile long. The wheel will be used for running the hoisting machinery. Power will be transmitted from the wheel to the hoisting works by means of a wire cable. The distance between the 2 is 1,200 ft.

RUBY GRAVEL MINE. *Messenger*, Oct. 27: In 2 weeks arrangements will be completed for taking out pay gravel. There are 6 ft of pipe clay between the gravel and sediment in the deep channel. Sediment extends 116 ft above and Supt. Colman figures its width there at 1,000 ft. The gold from the deep channel has been assayed in San Francisco, and found to be .907 fine, better than that of Rock creek in early times. Gold from the other Ruby channels assayed .875. About $4,000 worth of timbers are laid in for winter. The Ruby lies midway between the Miocene and Forest City.

BALD MOUNTAIN EXTENSION. At the Bald Mt. Extention, Forest City, there are 30 cars, used in the main tunnel, and 6 buggies, tipping gravel into the chutes, 50 men employed. The gravel ahead, far as tested, prospects richly. The clean-up last Sunday, was 80 ounces.

Tuolumne

BUCHANAN.—Sonora *Democrat*, Nov. 3. Work at the Buchanan mine is principally confined to sinking. The shaft is down 265 ft, with a ledge over 7 ft wide, all fine quartz, in the bottom. The law suit between the company and Mrs. Francisco has been compromised.

NEVADA.

Washoe District.

UNION CON.—*Enterprise*, Nov. 3: The joint Sierra Nevada winze is now about completed to the bottom of the dump below the 3100 level, and the first of next week the cutting out of a station will be commenced. The bottom still continues to show quartz that is rich in gold.

COMBINATION SHAFT.—The station for the new hydraulic pump is completed, and they are now putting in the foundation on which the machinery will be set up.

GOULD AND CURRY.—The new winze is east cross-cut No. 1, on the 2500 level, joint with Best and Belcher, is down about 30 ft. It will be sunk to the 2700 level, provided too much water shall not be encountered. Thus far the indications are that the winze will not touch the wet section, which proved so annoying in the drifts on the 2500 level.

HALE AND NORCROSS.—The south drift on the 2700 level has been turned to the west, and is cutting vein material of a promising character. The east cross-cut from the north drift on the same level is finding some good ore. The indications at this point are better than any found on the 2600 level.

UTAH.—The west wall having been found in west cross-cut No. 2, on the 1350 level, east cross-cut No. 2, just opposite, has been started. Lying against the west wall was about 10 ft of quartz, clay and porphyry.

ALTA.—The 2150 level is now about drained. As soon as the water is out of the drifts the work of cleaning out and repairing may be commenced, and then active prospecting will be in order.

BEST AND BELCHER.—Good progress is making in the joint Gould and Curry winze, just started in east cross-cut No. 1, on the 2500 level. It was yesterday down about 30 ft. It will be sunk to the 2700 level.

IMPERIAL.—The west drift from the 600 station is being rapidly advanced. It will be pushed out into the old upper workings, where it is expected that a good deal of low-grade ore will be found.

CROWN POINT.—The amount of ore extracted is gradually being increased. The mills on the river will soon be running to their full capacity, when a full force of miners can be put to work.

MEXICAN.—On the 2900 level have completed opening and making connection with the 2700 level. On the 3160 level the main north drift has been extended about 30 ft during the past week.

YELLOW JACKET.—A good deal of ore is now being extracted, and the amount is gradually being increased. Much ore has been developed at various points and can be taken out as wanted.

OPHIR.—Are taking out a considerable amount of low-grade ore from the 150 level. This is principally in the shape of filling that was packed away in the old openings some years ago.

SIERRA NEVADA. On the 2900 level are cutting out a station for a raise which will be carried up to the 2700 level.

CALIFORNIA.—Have completed repairing the joint Con. Virginia winze on the 2500 level, and have resumed sinking the joint Con. Virginia winze on the 2700 level.

ANDES.—Are still extracting some ore from the north drift. The drifts from the winze show some fine-looking quartz.

CON. VIRGINIA.—Have completed repairing the joint California winze on the 2500 level, and have resumed sinking the joint California winze on the 2700 level.

BENTON.—The draining of the Alta also drains this mine. As the water will now soon be out, prospecting can again be proceeded with.

BELCHER.—Not much is as yet being done in the way of extracting ore, as the mills on the Carson river can run but a few stamps.

OVERMAN.—Some low-grade ore is still being extracted from the old upper levels.

UNION SHAFT.—Are still easing timbers at the 2300 station.

Esmeralda District

A NEW FIND.—*Herald*, Nov, 3: On last Sunday A. L. Moore, found and located a magnificent ledge of very rich galena. The mine is 1 mile northwest of the Mexican camp. Mr. Moore has deeded 735 ft of the new find to Antone Costello. The mine is known as the Silver Wave. On the same day, Fredrick Smyth located an extension of the same. The parties are sanguine that they have the richest find in the district.

Belmont District.

BELMONT MINE.—*Courier*, Oct. 27: The mill and leaching works of the Belmont Mining Co. are now completed. The engine and boilers in the mill have been thoroughly overhauled and refitted and are as good as new. The following is a copy of the Superintendent's letter of October 27: Stopes in south tunnel are opened and yielding very high-grade ore in satisfactory quantities. No. 1 level in Laity ground advanced 12 ft during the week, developing a five foot stringer of ore at its junction with main ledge. This ground promises to be a bonanza. Started the mill this morning. Will take a day or two before we work to the full capacity.

Humboldt District.

A NEW CAMP.—Cor. of Eureka *Sentinel*, Nov. 4: "I have been to many new camps, as well as old camps, but I have never seen any to compare with Willow Creek in the number of large and well defined ledges, and, for what little work there has been done on them, the large amount of very rich ore developed. The deepest workings in the camp are not over 20 ft down. There are hundreds of the finest looking prospect lying around in every direction. There has been good deal of placer mining done in years past at the lower end of the canyon, and paid well, but owing to the bedrock being very deep and the country at that point flat, the white men abandoned the mines; but higher up the creek the canyon becomes narrower and steeper and the drainage much better, and I am positive from what prospecting I have done, that there are many places along the creek that will pay well in gold. Yesterday I was out prospecting for placers, and I found very encouraging prospects in coarse gold. Willow Creek Station, on the Idaho stage road, is situated just at the mouth of the canyon formed by Willow Creek, and is 55 miles due north from Winnemucca, the nearest station on the Central Pacific railroad."

Paradise District.

WILD GOOSE.—*Silver State*, Oct. 29: A report has reached us from Spring City that J. V. McCurdy has struck some very rich ore bodies within a week in the Wild Goose mine. On the 30th, 1 bar of bullion, valued at $2,348.33, was received at Wells, Fargo & Co.'s office here, from the Paradise Valley mill.

ARIZONA.

TURKEY CREEK.—Prescott *Courier*, Oct. 29: Charley Gallagher has discovered a mine in Pine Flat which is said to be as rich as the Pine Spring mine. The vein, which is large and well defined, is rich in chloride and carbonate. Chunks of horn-silver, similar to that of the Pine Spring mine, are being taken out of the new bonanza. The owners of the claim are Charley Gallagher, Tom Roach and Norman McLeod. The Union is looking fine, and tons of high-grade ore on the dumps. Practical mining men pronounce it the best in the district.

UNITED VERDE.—Prescott *Courier*, Oct. 31: The United Verde Copper Co. declares a dividend to-day, in New York City, of $37,500, being declared on the profits accruing up to Oct. 1st. Operations on the road to the mine have cost this company $31,000; arrangements for the bringing of the water to the same costing them $11,000; and the furnace plant and buildings, etc., have been paid for out of the proceeds of the one 30-ton smelter up to Oct. 1st.

SILVER MOUNTAIN.—A force of men are at work on the Mammoth mine. As it is a perfect mountain of ore, the men do not mine, they merely quarry. Some specimens recently seen by us are good to look at. The quartz is close-grained of beautiful colors and rich in metal.

GOLDEN RULE.—Tombstone *Epitaph*, Oct. 28: Very little stoping has been done on the Golden Rule, for the mine has been developed in such splendid shape that it has produced ore enough from shafts and drifts to keep the ore teams busy and mill running. The drifts from the bottom of the working shaft will have, by the time it is in as far as the drift on the first level, increased the value of the mine in tons of ore 8,000, and in money value $480,000. The actual value of all ore in sight in the mine is, tons 26,000, and the value $1,500,000, and 800 tons at the mill.

COLORADO.

CASCADE.—Idaho Springs *Gazette*, Oct. 27: The Eureka lode in Cascade district is improving. An entire change of rock has taken place, and at the present distance of 87 ft in the adit, 2 ft of highly mineralized quartz can be seen. Specimens of the solid ore assayed as high as $1,700 per ton.

HARDSCRABBLE.—Georgetown *Courier*, Oct. 25: This property includes the Avalanche, Hardscrabble, Dixey, Miner Girl and Lucinda mines. The present developments consist of an adit level run on the Hardscrabble lode 362 ft in length. On the Avalanche is a shaft 50 ft in depth, sunk from surface, disclosing a 6-foot crevice with good pay ore. Runs of the ore ranged from 400 to 600 ounces silver per ton. The main drift is 100 ft in length, all in good ore. The ore is known at the Shivcly mine as "coin rock."

NOTES.—The Seven-thirty mine continues to ship her full complement of ore. The last mill run amounted to $1,004.81. The first-class ran 631 ozs. silver per ton, and 37 per cent lead. The Pay Rock concentrator, at Silver Plume, is kept running steadily day and night on the dump material of the Pay Rock mine. It has so far proved a grand success. The Garfield lode is looking well. The tunnel on the vein is 67 ft in length. A streak of quartz, galena and sulphurets, 2 inches thick, has been struck. In No. 6 level on the Pelcan Dives lode a force of miners is now drifting west. They have from 1 to 3 ft of mineral, that ranges about 35 ozs. per ton silver, and 40 per cent lead. This property is shipping 100 tons of ore per month. John Halls & Co., who are drifting east from the 80-foot shaft on the No. 3 tunnel on the Baker, report the mine in good shape. The crevice is 12 ft between walls. The first-class ore runs 230 ounces silver per ton. The streak measures 3 to 4 inches in width. T. W. Cunningham, from Decatur, informs us of another important strike in the Horseshoe district, in the Queen of the West group. In the 135-foot drift, four inches of green and blue carbonate of copper with galena has been encountered. This property will be worked all winter.

IDAHO.

STAR.—Wood River *Times*, Oct. 26: The new strike made in the Star mine, in Star gulch, within 2 miles of Hailey, consists of 3 streaks of ore. One of these is 4 inches wide, of gray copper and galena, which assays over 1,000 ounces silver per ton. This was found just about where the Salt Lakers who bonded the mine last summer got disgusted and quit work. The drift is in 20 ft on the new field, which seems to improve as run upon. There are 16 men working, and by next week Mr. Wolters, the superintendent, will have 12 of them working in ore. He intends next month to make an unusually heavy run, before the bad roads begin, and will extract at least 100 tons, that will sell for $175 to $200 per ton.

FISHER.—Ketchum *Keystone*, Oct. 24: The Fisher mine and mill, in what is known as the Pig Tail district, 18 miles east of Sawtooth City, has been bonded to Col. W. H. Broadhead. The Fisher is purely a gold mine, there being no traces of silver in the rock, and it is remarkable as being the solitary gold ledge of the Sawtooth and Salmon country in that part. The lode has been demonstrated by shafts and a 300-ft tunnel to contain an ore shoot 500 ft in length. The average width of pay vein is 12 to 15 inches, and the lowest grade produces $40 per ton in gold. The lode has been located a distance of 4500 feet.

SAWTOOTH.—The Columbia & Beaver mill continues to run on Silver King ores, and now, since fully under headway, turns out a bar daily, valued at a little over $1,000. It is estimated that the total product for a 60 days' run, to November 10th, will amount to $60,000 in the bar. The mill will run till that date, when operations will discontinue till spring.

MINERAL DISTRICT.—The *Keystone* credits the following items to the Weiser *Leader*: The Black Hawk has 4 men at work. The Daniel Boone are down about 40 ft. The rock assays 400 ounces silver, with a trace of gold. The tunnel is in about 100 ft. The Black Maria, owned by Boggs & Landy, is progressing, the incline being down about 100 ft. They will crosscut each way. Recent assays show that the ore goes 80 ounces silver—$103 45 per ton—$2 in gold. Egan mine, owned by George Huffman. Tunnel in 25 ft. Has assays that go 400 ounces, and will average 50 ounces. Lady Bank, owned by George W. Maxwell, has a tunnel in 90 ft—copper in various forms, and large percentage in silver. Last Chance has a tunnel of about 65 ft. Assays show 14 per cent copper, and rich in silver.

MORE CREEK.—Idaho City *World*, Oct. 23: F. Hayden is preparing to put a bedrock flume in More creek, to commence at the gap a short distance below the Warm Springs, and run up half a mile, for the purpose of working ground—a bar—that is now covered with tailings. The flume is to be 40 inches wide and 5 ft deep.

NEW MEXICO.

BULLION MINE.—Southwest *Sentinel*, Oct. 24: The claim is upon a contact of lime and porphyry, and the main ore workings are in lime, from the surface down. The depth now attained is 115 ft, and the ore throughout has shown up in the shape of pipe veins rather than deposits, being of all grades, and some small bodies running as high in assay as 29,000 ounces to the ton. We saw specimens of wire-silver from this mine which were of wonderful beauty and almost fabulous value. The ore is a sulphuret, and the shipments of selected are about 30,000 pounds per week, which is safe to run between 200 and 300 ounces to the ton. The consignee is the Colorado Sampling Co., of Denver, who handle the ore, sample it thoroughly, and sell in open market to the highest bidder. The demand for rich ores from New Mexico is growing, and returns upon shipments show a steady improvement.

SUPERIOR.—The aggregate shipments reach 22 car-loads, being a little less than 300 tons, and the product in money figures is about $60,000 for the past 5 months, the first car-load having been shipped in May. Shipments are regular, at the rate above indicated. There are upon the dump some 700 tons of lower grade ore, which will be utilized as opportunity offers.

IRON KING.—In the first level, 35 ft below the surface, Mr. Welch has recently opened what he calls his diamond mine. It is some 150 ft from the mouth of the drift, and in truth, the uninitiated coming suddenly into the chamber would be dazzled by the display. The opening is 10 ft by 12, and perhaps 10 ft in height. Each and every square inch of the surface, including roof and floor, is a glittering mass of fine galena ore, the flakes or crystals ranging in size from a pin's point to a half dime, and as bright and glistening under the rays of the candles as so many veritable diamonds. How far this chamber will extend is a matter of conjecture. The ore is of a decomposed character, very readily worked, and is safe to run 100 ounces to the ton. It is in connection with this property that a smelter is being erected at Kingston. Excavations for foundations have been commenced, and the 1st of December will see the entire plant on the ground. It includes a 70-ton smelter, such as are in use at Leadville, and the works will be of such capacity as to run 3 of these.

BULLARD PEAK.—Silver City *Enterprise*, Oct. 26: A sale of importance took place on Wednesday, in which 4 claims, the Butter-nut, Pumpkin, Stonewall and Neptune, in the Bullard Peak district, were transferred by the locators, James Sullivan, John Mullen and John Black, to Deurich Schule, of St. Paul, Minn., the price paid being $5,000 cash. The claims have fallen into hands that will immediately set in to develop the property.

MONTANA.

POLLOCK.—*Inter-Mountain*, Oct. 26: The Pollock is the name of a prospect owned by W. A. and J. K. Clark. The claim contains two distinct veins. On the northern vein a shaft now 30 ft deep is being sunk, on a very well defined streak of ore which samples 80 ounces per ton. East of the shaft a tunnel is being run in on the vein, and has attained a length of 150 ft. Its face is now 50 ft from the point where it will interseet the line of the shaft. It contains considerable ruby silver. The shaft on the south vein is 40 ft deep, and shows all the way down a remarkably rich streak of ore, of a uniform width of 3 ft and sampling over $100. It makes the best showing of any prospect in the district.

POSER.—From A. W. Barnard it is learned to-day that the development of the Poser continues with encouraging results. The total length of the lower level is now 150 ft, and drifting is in progress both east and west on an ore breast which varies in width from 9 to 15 ft. Only a small force of men is employed, but owing to the ease with which the ore can be mined the daily product averages 20 tons, which pulps in the Silver Bow mill about $35.

COLUSA.—A private letter just received at this office, from London, states that the negotiations for the sale of the Colusa mine and plant to English capitalists have been almost concluded. The price, if the sale goes, is understood to be $1,500,000, which is considered low by those who understand the immense productive resources of the mine.

ALICE.—*Inter-Mountain*, Oct. 27: At a depth of 300 ft a cross-cut was extended to the south vein. From the face of this cross-cut drifts east have been extended for 100 ft and the ore-showing is a grand one. The quartz has an average width of 4 ft, and is richer than any ore taken from the Alice for the past 4 years. Mr. Hall states that the south vein product samples from 150 to 200 ounces, and that the supply is continuous and reliable. It is a fine-grained, black sulphuret, easy to mill, and largely mixed with native silver. On the 200 level some good ore is also being extracted. The Alice is now producing 60 cars of ore daily, and Mr. Hall states that he could easily supply the 2 mills from that property alone.

OREGON.

WASHINGTON DISTRICT.—Cor. Bedrock *Democrat*, Oct. 24: Work is progressing finely. The Black Maria is down 91 ft and shows a fine body of ore. Some of the assays go as high as 311 ounces per ton, making $402 per ton. The Egan is a fine prospect, showing a body of ore 10 ft in diameter. The tunnel is in 30 ft. The Daniel Boone is a fine looking mine. The incline is down 32 ft. Some of the ore goes as high as 500 ounces per ton. The Atlanta and the Idaho, on the south of the Daniel Boone, are good prospects. On the east of the Boone are the Lady Jane Gray and the Martha Washington. The owners of these mines, owing to the lack of capital, have not done much to develop them. John Morrison, of Weiser, has bought the True Blue, an extension of the Black Maria. We are bound to have one of the best mining camps in Idaho. I have been here 2 years and never lost faith in it. I think that ore that goes 500 ounces of silver to the ton is a pretty good thing. There are about 40 miners here and most of these will winter here.

JOSEPHINE COUNTY.—Jacksonville *Times*, Oct. 26: Miners of Josephine county are generally ready for the next season. Geo. Livingston, Supt. of Bybee & Co.'s claim near Waldo, is putting the same in first-class order. N. De Lamater is fitting up his mining claims near Kerbyville. Frank Ennis is engaged with Geo. Simmons of Waldo is opening some extensive placer claims. The cutting of a large tunnel has been commenced.

UTAH.

PREUSS DISTRICT.—Southern Utah *Times*, Oct. 27: The first location starting from the south is the Lynn Payne, owned by R. V. Tone, who has sunk an incline shaft 60 ft, and drifted 20 ft towards the hanging wall, through soft low-grade ore, which has yielded assays from 5 to 30 ounces of silver per ton. Next, on the north, is the Morning Star. But little has been done on this property, notwithstanding the croppings are very large and show well in both gold and silver. Between this location and the Tiptop there is 2 miles of unlocated ground. Considerable work has been done on the Tiptop. * * * * * The Mountain Queen is too well known to need description, and will soon again talk for herself. The Silver Hill is next, and shows up a 4-ft vein, carrying gold, silver and lead ores.

CAVE MINE.—Last Wednesday a party of Friscoites drove over to Bradshaw camp and visited the wonderful Cave mine, one of the group owned by the Frisco M. & S. Co. The new ore chamber had just been broken into. The extent of the ore body could not be calculated, but its average thickness as far as it could be followed was 10 ft. The ore is a carbonate of lead, of an assay value of 55 ounces silver, 2½ ounces gold and 48 per cent lead to the ton. The mine, or rather the Cave group of mines, is a series of caves connected by system of tunnels, drifts and chutes, and it is reasonable to presume that the astonishing developments will cause the company to erect smelting works ere long and increase the daily output to 75 or 100 tons.

WASHINGTON.

COEUR D'ALENE.—Wood River *Times*, Oct 24: Thos. Bentley, the well known prospector, got in yesterday morning from the Coeur d'Alene mines. He came to make arrangements to go back there soon, to remain all winter. The Coeur d'Alene country, Mr. Bentley says, is not shown to be as rich as has been reported; but is as yet too new to justify any positive expression of opinion as to its merits. It is situated in the Coeur d'Alene mountains, about 200 miles northwesterly from Butte, Montana, 25 miles north of the Northern Pacific railway and 60 from the Canadian frontier. The placers pay from nothing to $100 a day. The quartz ledges are not yet worked. The region is of unknown extent, and for aught that is known to the contrary may extend to the north pole. Roads and trails are being made in the Coeur d'Alene mountains, and it is probable that travel in and out will be kept up all winter. But there will not be much to do before next spring for those who have not already located claims. There were about 1,000 persons there 10 days ago, and others were crowding in from every direction, but the rush is expected next spring. The country is taken up for miles. Mr. Bentley has an interest in a placer claim and owns 2 quartz claims.

ANOTHER.—*Inter-Mountain*, Oct. 29: Barney Roundabush is going back to the Coeur d'Alene just as soon as he can get his provisions packed. He says "there is one gulch which undoubtedly contains gold in paying quantities for a length of 12 or 14 miles. Every foot of it is taken up. Each claim contains 20 acres. Bedrock in the bottom of the gulch has not yet been struck, though we are running a drain for it. The gold so far discovered comes from the rim rock. Some of the ground pans from $1 to $5 per pan, but of course it does not abound everywhere, though only small sections of ground at different places have been prospected. From results so far achieved it is quite evident that what ground has been worked is far richer than the Alder gulch diggings in '62, '63 and '64 which averaged only 5 cents to the pan. I was there during the finish times."

Scientific Mining in Europe.

Before the Department of Mining Engineering in Yorkshire College, recently, Mr. Arnold Lupton, instructor, gave a brief account of some of the points of interest noted by him in a recent inspection of mines and mining schools in Belgium, Westphalia, Hartz Mountains, Saxony, Silesia, Hungary, etc. The lecturer stated, that whilst in England the art of coal mining had reached a high degree of excellence, on the Continent there was a higher average of excellence in all those operations where scientific training was required, and the number of those operations was greater than was sometimes supposed. As instances, he mentioned that in England the speed and economy of the production of coal was perhaps greater than on the Continent. On the other band, the method of sinking shafts through subterranean lakes of water to dry ground below—an operation impossible by the ordinary method—was the great invention of a German and a Belgian engineer. At the present time, at continental mines, there was much greater economy in the use of fuel for the production of steam power. As a general rule, no smoke—that extravagant and unnecessary curse of English mining and manufacturing districts—was made, and steam was always used expansively. Electricity was used for underground lighting, shot-firing, signaling, and transmission of power, and the high education of officials made it quite easy for them to establish and use any new invention.

The lecturer described some of the large water-pressure pumping engines in use in the Hartz Mountains. These engines were nearly 700 yards below the surface, and were worked with the natural pressure of water due to the difference in the height of the reservoir of collected rainfall on the surface and the off-take level, seven miles in length and 1,300 feet below the pit top. At Zankcroda, near Dresden, there is a colliery where underground haulage is done by means of an electrical locomotive. This has now been at work for more than one year, and gives satisfaction. The lecturer had traveled on this locomotive, which received its power from a little steam engine and dynamo on the surface. The machine was the size of a little pony, and it did the work of five large horses. The apparatus is exceedingly easy of construction and moderate in first cost, and these qualities recommend its adoption in many cases. After referring to other points of interest, the lecturer alluded to the mining schools established or subsidized by government at Liege, Clausthal, Freiberg and Schemnitz, all of which he had seen. As an humble representative of the Yorkshire College, he had been received with the utmost courtesy, and all the mines and schools where he had been were thrown open to his inspection, and every information afforded. At the lead mines of Meternich, the largest in the world, there was a stratum of sandstone containing galena, sixty yards thick. The bottom bed only is worked, twenty yards in thickness. It is worked on the pillar and stall system, and great chambers are excavated twenty yards high, thirty yards wide, and forty yards to sixty yards in length. These are illuminated by the electric light; and the lecturer had an opportunity of taking a photograph of some of the officials and workmen. Another illustration of the use of electricity in mines on the Continent is the method of signaling in a deep mine near Freiberg in Saxony. There a copper conductor is carried down the shaft, and by means of a specially contrived apparatus a signal can be given for the cage whilst it is in motion, so that a man traveling up and down the shaft can stop the cage at any place he desires, by striking a rapper which is on the cage. In Upper Silesia a seam of coal is worked twenty-four feet in thickness. The coal is of excellent quality, and is used in the large iron works adjoining. Ten million tons of coal are annually raised in this locality. The mine is worked in a very scientific and careful manner. Timber trees, twenty-four feet in length, are used to support the roof, and cross-bars going from tree to tree prevent any material falling which may cause danger to life or limb. The mode of working is so systematic that not more than ten per cent of the entire seam is left in the mine, and it was impossible to visit the mine without thinking that in some respects English managers of thick-seam coal mines have something to learn.

The chairman, in submitting the vote of thanks, said that it was some reflection on the mining interest of Yorkshire that the chair of mining engineering was supported by the Drapers' Company of London, to whose generosity they were indebted for the existence of the chair, and thought the mining interest should still further supplement the endowment so as to provide the instruction with more apparatus. He fully agreed with the statements contained in the able and interesting lecture to which they had listened, and the College was to be congratulated on its professor of mining engineering; he had himself visited many of the Continental mining districts, and could speak of the high class of education there obtained by all the officials, and he thought all the officials at English collieries ought to be educated so as to know the relation between cause and effect. It was not that they were all to be made mining engineers, because that might involve a still higher grade of education, but all ought to have a theoretical training to explain and guide their practical experience. He thought that in large collieries England could show some examples that were unequaled in the world, but in metal mining, undoubtedly, his experience was the same as that of the lecturer, that on the Continent the average of practice was superior to English, and the remedy was to be found in the instruction now given by such institutions as the Yorkshire College.

Breakage of Hoisting Ropes.

In the Minutes of Proceedings of the Institution of Civil Engineers, Vol. LXXIII., just issued, at page 447, is an abstract of a paper by Franz Peters, on the "Breakage of a Wire Rope at the Duke Hardenburg Colliery, Westphalia." It will be interesting to peruse the abstract in question:

"On Dec. 21, 1882, a winding rope broke at the Duke Hardenberg Colliery, Westphalia, whilst raising to the surface 25 men, who lost their lives. The rope was of cast steel, and made at the works of C. L. Neufeld, of Dortmund, and consisted of seven strands, each constructed of a core of three wires, made of annealed crucible steel, each wire having a diameter of .005 inch. The seven wires next the core in each strand were of crucible steel, 2.2 millimeters (.0866 in.) in diameter, and the twelve outer wires were of the same material, and were 2.4 millimeters (.09449 in.) in diameter. The main core around which the seven strands were turned consisted of six strands, each strand of six wires, made of annealed iron, 2 millimeters (.0787 in.) in diameter, the core being of tarred hemp.

According to the regulations of Mining Police, the carrying power of crucible steel wire is limited to 114.6 kilogrammes per square millimeter (72.8 tons per square inch), that of annealed crucible steel to 80 kilogrammes per square millimeter (50.8 tons per square inch), and for annealed iron wire, 45 kilogrammes per square millimeter (28.5 tons per square inch), and accordingly the strength of the rope was equal to a total carrying power of 71.42 tons. According to the customary trials made with the wires of which the ropes are constructed in the works, the rope was found to be capable of carrying 80.39 tons. After the breakage the Mining Police took possession of the first 5 meters of the rope next the breakage, for trial, while 6 further meters were tried at the colliery, the results of which showed that the rope had deteriorated 18.25 per cent, after 11½ months' wear. The weight carried by the rope when raising coal was:

	Tons.
One cage complete, double decked (for four tubs)..	2.214
Four empty tubs or trams, averaging each 5.9 cwt.	1.181
Capacity of tubs—40 cwt. of coal, nearly	1.968
Weight of rope from pulley to deepest landing, 426 meters at 6.5 kilogrammes (13.1 lbs per yard)....	3.020
Total.....	8.383

Thus the rope could carry 8.5 times the load, and according to the trials made with the wire, 9.6 times, while after breakage the rope was still capable of carrying 7.8 times the load.

According to the regulations enforced by the Mining Police, the weight of the men allowed to be raised or lowered must not be more than one-half of the load when coal is raised. Therefore, in this instance $1.181 + 1.968 \div 2 = 2.574$ ton and allowing for the doors which are fixed in the cage when the men ride, 1.476 ton was the mean carrying capacity of the rope, which meant 20 men, allowing each man the average regulation weight of 1.48 cwt. (11.48 stone.) However, 25 men were in the cage at the time of the disaster, but this infringement of the law would not account for the accident.

On examination the rope showed that, after fracture, five of the seven strands were broken off nearly in one plane, and the fracture of each wire seemed as if it had been broken in a proof machine. The other two strands reached 150 millimeters and 250 millimeters beyond the fracture. This examination seemed to prove that the rope had broken suddenly. No marks were found on the guides of the pit to justify the surmise that the cage had become tight or wedged in them, and from the fact that the grease on them was found undisturbed, shows that the cage fell down the shaft without hindrance. The rope broke 1.5 meter above the shackle, and during the 11½ months of its use had been four times resocketed. The safety arrangements attached to the cage did not come into operation, found on examination to be due to derangement, probably the result of the sudden breakage of the rope.

The author, by elaborate calculations, endeavors to prove that the rope broke owing to the engineman forgetting, by oversight or accident, the near approach of the cage to the surface, when winding at a considerable speed, about 13 meters per second, and, fearing an overwind, he had applied the brake so vigorously as either to bring the engine quickly to rest, or so considerably slackened its speed that the cage traveled faster than the rope (owing to its momentum) formed slack rope, then, falling back on the slack rope, jerked and fractured it. The cage was so near the surface that the banksman just caught a glimpse of the bridle chains when it disappeared from his sight."

It will be observed that the law was infringed in this instance, 25 men riding in the cage instead of 20, that the rope snapped just as the cage reached the surface, that the breakage took place about 5 feet above the shackle, that the rope had been four times cut at the end and reshackled, and that although the cage was fitted with doubtless one of the best of the many Prussian safety arrangements, yet that this part of the apparatus failed to act, and 25 men were dashed to the bottom of the shaft (426 meters, or 1,397 ft.), and instantly killed.

Workingmen's Houses.

Herr Krupp, whose works are now larger than Essen itself, employing, including those engaged in the mining, 20,000 persons, began life on a small scale. In 1848 he did not employ over seventy persons in the cast steel manufactory. Essen, for a manufacturing place, is clean and well built. The road leading to Krupp's was shaded by trees on both sides. The area occupied by the works is much greater than that covered by the town of Essen itself, though the population, according to the census of 1880, was nearly 60,000. A road runs through the center of the works and leads to the colony, as it is called, where the operatives live. After nearly four hours' steady and rapid walking through myriad shops, some making crucible steel, some puddled steel, some Bessemer steel, and some Martin steel, through mills making steel rails, steel tires, iron and steel plates; iron foundries for machine castings and for projectiles; locomotive and wagon wheel works, boiler and girder shops, gun shops, mechanical shops, smiths' and a score of other kinds of shops, one is conscious only that he has had a bird's-eye view of Krupp's works. In these shops there are no fewer than 1,600 furnaces of various construction, not far from 300 boilers, between eighty and ninety steam hammers from 100 to 50,000 kilos. weight, twenty-five rolling trains, 320 steam engines, of from 2 to 1,000-horse power, and about 1,700 machine tools of various kinds. The machine shops remind me of those in Elder's shipyards at Glasgow, while the works as a whole seemed like several large steelworks combined into one. Nearly 3,000 tons of coal and coke are consumed daily in the works, and the smoke escapes from innumerable tall chimneys and blast furnaces. The establishment has its own water and gas-works, and besides the electric lights, there are 25,000 burners. The firm have their own chemical laboratory, photographic and lithographic establishment, printing shop, and bindery. There are about 50 miles of telegraph, and thirty-five telegraph stations belonging to the establishment. After I had inspected the works and admired the gigantic guns and the shops in which they were made, my guide kindly offered to take me to the colony to see the homes of the working men. These houses are not far from the works, but are comfortably located on high ground, and well shaded with avenues of trees. The firm of Fried-Krupp at present owns 3,250 well built, and to all appearances, healthy dwelling houses, in which over 16,000 individuals are living. The buildings have two or three floors, and are constructed partly of stone and partly of frame-work, and are surrounded as much as possible with gardens. The single dwellings, which, besides cellarage and garret, have from two to four rooms, are self-contained, and separated from the other dwellings. The letting to lodgers is permitted only in dwellings of three to four rooms, and must receive the special permission of the Central Committee appointed for maintaining cleanliness and order. The rent for the family dwellings varies as follows:—

	Per year. £ s. d.	£ s. d.
For two rooms in lodging-house or barrack-house.....	3 0 0 to 4 10 0	
For two-room house with cellar...	4 10 0 to 4 15 0	
For three-room house with cellar.	6 0 0 to 8 0 0	
For four-room house with cellar...	9 0 0	
For five-room house with cellar....		

Thus, for 4s. a week—the usual price for small cottages in the industrial districts of England—the German artisan at Essen can rent a large house and garden; while for 1s. 2½d. a week the British workman could not get a room. The Dundee pig-styes and the hovels of South Wales are rented at 2s. 6d. to 3s. a week. I visited a sample of each of the houses at Essen, and conversed with some of the inmates. Upon the whole they are better off than the industrial classes in many of the English districts. At the same time they did not strike me as more comfortably situated than the working people of a place like Middlesborough, where the houses are new and the operatives fairly well paid. The interiors of some of the Essen houses were any thing but clean and the atmosphere foetid. There is certainly no squalid misery, and the average workman and his family have plenty to eat and are comfortably lodged. The German drinks beer, and in the summer spends the evening, often with his family, in the beer gardens, of which there are seven belonging to Krupp. The German workman is more moderate, more economical, and drinks less gin than the iron-worker of Scotland and England, and rarely beats his wife. But even in a place like Essen, which is above the average, there is a marked difference between the Continental and American working man, and the condition of workers here will not compare with the advanced condition of the artisan in such places as Johnstown and Pullman in our own country. The single men at Krupp's are provided for in a large boarding-house, capable of keeping 1,800 boarders, at a cost of about 80 pfennigs (20 cents) a day, bread not included, making the probable cost about 1 mark, or about 25 cents per day. Herr Klupfel, the director, who has charge of the labor department at Krupp's, told me that no men were now being paid less than 3s. a day—this, of course, to the unskilled laborer. Skilled labor is paid from 3s. 6d. to as high as 7s. and even 9s. a day for skilled mechanics in the machine shops, but this was of course exceptional, the wages not often exceeding 5s. For these same classes of labor the American manufacturer probably pays 10s. or 12s., and even 20s. a day. Connected with Krupp's are sick and pension institutions, out of the funds of which temporary support and pensions are paid to members who have been disabled in the service of the firm, or to their widows; also to those who have worked for many years and are too old for further service. There are also a hospital, bathing establishment, life insurance union, and primary and industrial schools, all connected with the firm. The labor of women and children is excluded from the works."

"Speiss"

Who Discovered the Secret of Value in Slag Piles?

The answer to this question would be generally interesting in the scientific world, but particularly so in Eureka. It is here, we believe, that the "lead bath" process was first applied to extract from "speiss" (until recently looked upon as mere refuse from the furnaces) the small per cent of the precious metals that it retains. The process has proved very valuable, as is shown by the "bonanza" developed in the Richmond slag dump, in which, as in a new mine, a force of men are employed extracting lead and "speiss," on which one furnace is kept continuously at work. Just what the "lead bath" process is, or what the results of working by it have been, can not be accurately stated. There is an air of secrecy and offishness about those who are said to be informed which impels inquiry. Its evident importance, however, judged by what report says of the developments in the Richmond dump, and Hauk Donnelly's project to apply the process to the big Eureka Con. dump, make people talk about it considerably. St. George T. Bryant is said to have discovered the principles involved in the "lead bath" process which are being applied now at the Richmond works. It is stated that some years ago he suggested the idea to Mr. Probert, who put him aside impatiently, and that he broached the subject afterwards to Hank Donnelly, Superintendent of the Eureka Con., who brusquely invited him to stand aside, as he was in the way of the miners. It seems, according to report, that Mr. Prohert reflected on Mr. Bryan's proposition at a later day, and put his ideas to a successful practical test, as intimated. And now comes Mr. Donnelly, so the story goes, and leans upon Mr. Bryant as his right hand man in his great project to separate the gold and silver and the iron from the speiss accumulated at the reduction works of the Eureka Con. Mr. Bryant is at present East, and it is said that his business is in the Patent Office at Washington, D. C.; in other words, that he has gone to headquarters to take the necessary steps to get out a patent for the invention of the "lead bath" process, as it is known in Eureka. It is speculated, also, that Mr. Probert claims a right to a patent to the same or a similar discovery—the process in use at the Richmond—and that he either has applied for a patent or is about to do so; and that he will protest against the right of Mr. Bryant to the patent in question. There are those who say that St. George has slept upon his rights until he has practically forfeited them, and that all he can do will be to bar anybody else who applies for a patent for an invention the principles involved in which he is alleged to have discovered a good while ago; while there are those who say that he has the inside track in the whole matter. Again there are those who say Mr. Probert is master of the situation, and fully entitled to the mastery. The report here is that he is en route to Washington City to measure words (figuratively speaking) with the chivalric St George.—*Eureka Sentinel.*

The Largest Locomotive.

There is now a mammoth locomotive in process of construction at the Central Pacific shops at Sacramento. The name is "El Gobernador." The total length of the engine and tender is 65 feet and 5 inches; driving-wheel base, 19 feet and 7 inches, five pairs of drivers, 4 feet and 9 inches in diameter, with a four-wheel truck in front; water capacity of tender, 3,600 gallons; cylinders, 21 inches in diameter, with a 36-inch stroke; total weight of engine, 73 tons; weight on drivers, 64 tons; weight of tender (light) 50,650 pounds; total weight of engine and tender (light), 98 tons 650 pounds. There are two six-wheel trucks under the tender, making a total of 26 wheels under engine and tender. The valve gearing, designed by A. J. Stevens, is something entirely new, there being nothing like it in the country. It is said to be the largest engine in the world. It is for use on the Sierra Nevada Mountains, and it is expected will do more work than two of the engines now used, with less consumption of fuel. The heaviest engine now in use on the C. P. R. R. has hauled 19 cars, loaded, up a 116 foot grade. Its dimensions are: Weight of tender (light), 63,000 pounds; weight of engine, 123,000 pounds; water capacity of tender, 3,000 gallons. It has 8 drivers of 4 feet 8 inches each; driving wheel base, 15 feet 9 inches; total wheel base, 53 feet 1¾ inch,

Antimony.

The ore of this metal occurs abundantly in California and Nevada, as well as in other parts of the Pacific division. The heaviest deposits, so far as known, exist at the Bonshay and Temple mine, in San Emidio Canyon, Kern County, California, and at a point twelve miles south of Battle Mountain, a station on the Central Pacific Railroad, in Humboldt County, Nevada. At the latter place the ore occurs in two parallel veins, about 100 feet apart, and cropping out strongly for the distance of a mile or more. These veins are nearly vertical, and stand between regular, well defined walls. From one of them, which carries a stratum two feet thick of solid sulphuret of antimony (stibnite), several hundred tons of ore have been extracted. Some of this was reduced in the small works put up at Battle Mountain Station, and some lots were shipped to San Francisco and New York, but the bulk of it was left on the dump at the mine. An analysis of an average sample of this ore, rough dressed, gave the following result:

Moisture	2.83
Alumina	1.65
Silica	12.62
Antimony	62.28
Bismuth	6.63
Sulphur	19.31
Oxygen (calculated)	4.06
	99.30

While this ore carries from three to fifteen ounces of silver per ton, it is entirely free from lead and copper, a feature that greatly facilitates its reduction to a regulus by the most inexpensive and simple process. Some of the metal disposed of in the New York market is said to have given entire satisfaction, though not quite free from sulphur. Mining the ore at this point costs $2 per ton; freight to San Francisco, $10 per ton; hauling to the railroad, $4 per ton. To England, via Cape Horn, $15 per ton; value of ore in England, $50 to $60 per ton; regulus, 12 cents per pound. After being worked in a small way for several years, commencing in 1871, operations were suspended at this mine, nor has much been done there since, the bulk of the ore being of too low grade to warrant further attempts at handling it.

The lode San Emidio is represented to be much larger than at the Battle Mountain mine, being from thirty to forty feet thick, and containing immense quantities of ore; some of it very rich, the mass of it, however, of rather low grade. A good deal of money was expended there in 1876 in the erection of a furnace, building roads and making other improvements, but the enterprise having failed to prove remunerative, work was soon after suspended, and has so remained since. The principal obstacle in the way of success here was the cost of transporting supplies to and the ore and metal from the mine, which is situated high up in the mountains and a long way from the railroad. A similar enterprise, attended with not unlike results, was inaugurated about the same time at the Stayton mines in San Benito County, California. Two furnaces were put up here, and other improvements made at considerable cost, but the undertaking, though well managed, had to be given up after a few years' trial, the cost of production and transportation to available markets being too great to leave any margin for profits; and yet the ore of this locality would in most countries be considered high grade, having averaged about forty per cent metallic antimony.

Under the impression that they would be able to obtain an adequate supply of antimonial ores cheaply, Messrs. Starr and Mathison, of San Francisco, erected in that city several years since works for the reduction of this class of ores. Although these works were of limited capacity and the metal produced was equal to the best imported, the proprietors, after struggling along for a few years, were obliged to close the works, having been unable to get enough ore of suitable grade to keep them running. As they had to market the product of their works in New York, they were unable to smelt ore carrying less than fifty-five to sixty per cent metal. The consumption of antimony on the Pacific Coast is inconsiderable, amounting perhaps to not more than twenty-five or thirty tons per year; not much is used except in the manufacture of type, britannia ware, and babbit metal.

The shipments of antimony ore from San Francisco to England amounted in 1882 to 85,850. The Southern Pacific railroad carried East during the same period 60,130 pounds of metallic antimony shipped from San Francisco and Oakland.

Antimony occurs as a sulphide, and probably in other forms, associated with silver, lead, copper, etc., in many veins and deposits of ores of the latter metals throughout the Rocky Mountain region, but as yet has not been found in sufficient quantity to become commercially valuable. In the Wood River County, Idaho, it occurs in association with the argentiferous lead ores, as is very generally the case in the silver-lead districts of the Far West. The distance from reduction works, and the high cost of transportation, will prevent the successful working of any but the richest and the most accessible deposits.—*Mineral Resources of the U. S.*

THE question of making a second canal across the Isthmus of Suez is occupying the active attention of the Egyptian Government.

USEFUL INFORMATION.

Wetting Lead-Pencils.

The act of putting a lead-pencil to the tongue to wet it just before writing, is one of the oddities for which it is hard to give any reason, unless it began in the days when pencils were poorer than now, and was continued by example to the next generation.

A lead-pencil should never be wet. It hardens the lead and ruins the pencil. This fact is known to newspaper men and stenographers. But nearly every one else does wet a pencil before using it. The fact was definitely settled by a newspaper clerk away down East.

Being of a mathematical turn of mind, he ascertained by actual count that of fifty persons who came into his office to write an advertisement or a church notice, forty-nine wet a pencil in their mouths before using it. Now this clerk always uses the best pencils, cherishing a good one with something of the pride a soldier feels in his gun or his sword, and it hurts his feelings to have his pencils spoiled. But politeness and business considerations require him to lend his pencil scores of times a day. And often, after it had been wet till it was hard and brittle and refused to mark, his feelings would overpower him. Finally he got some cheap pencils and sharpened them, and kept them to lend. The first person who took up the stock pencil was a drayman, whose breath smelt of onions and whisky. He held the point in his mouth and soaked it several minutes, while he was torturing himself in the effort to write an advertisement for a missing bull-dog. Then a sweet-looking young lady came into the office, with kid gloves that buttoned half the length of her arm. She picked up the same old pencil and pressed it to her dainty lips preparatory to writing an advertisement for a lost bracelet. The clerk would have stayed her hand, even at the risk of a box of the best Faber pencils, but he was too late. And thus that pencil passed from mouth to mouth for a week. It was sucked by people of all ranks and stations, and all degrees of cleanliness and uncleanliness. But 'twere well to forbear. Surely no one who reads this will ever again wet a lead pencil.

INCOMBUSTIBLE PAPER.—At the recent meeting of the French Societe d'Encouragement pour l'Industrie Nationale, M. G. Meyer, of Paris, submitted specimens of paper specially manufactured to resist fire. It was stated by him that the papers and documents shown had been for four hours in a retort in a pottery furnace, and it is further affirmed those present were unable to distinguish, either by appearance or texture, the papers so treated from others which had not undergone the ordeal of fire. From experiments made with a specimen of wall paper sent us, we are enabled to say that, although the appearance of the paper does not change, the fire resisting properties claimed for it are undoubted; the paper certainly does not ignite. The paper, we are informed, can be made of a quality suitable for deeds and other important documents, or of a quality suitable for wall paper, theatrical decorations, or in fact for any purpose for which paper is used. M. Meyer has also invented an incombustible ink and incombustible colors. Artists using those colors may preserve their works to a certain extent; but the invention would appear to be of the greatest value to theatrical managers. By using thick cardboard of M. Meyer's material, together with his paints, they are able to render their scenery uninflamable. At the same time, for documents of importance, deeds, wills and agreements, the invention should come into universal use.

A NEW PAPER-MAKING SUBSTANCE.—A Frenchman, M. Reynaud, has discovered a new fiber for paper-making, in Algeria, in the shape of the dwarf palm, a great enemy to agriculturists. This plant is full of fiber, and the gentleman named has found means for utilizing the whole of it, except the roots, which serve for firing. Every part from the stalk to the topmost leaves is transformed into fiber of excellent quality, and it makes no difference if the plants have been pulled up several years previously. They are placed in a kind of cage, which is immersed in a boiler containing a special lye, and heated. The substance thus treated becomes soft, so that the fiber may readily be separated. It is withdrawn from the bath, and drained, the lye being saved for rollers, while, at the same, time being made cold use over again. It is then passed between by quantities of water. The number of rollings, rinsings and combings, depend upon the degree of fineness required. At last the product is allowed to fall into a receptacle containing clear water, whence it is withdrawn, to be tied up in bundles for transport.

ADULTERATION OF LARD.—The Board of Trade of the City of Chicago has succeeded in puzzling several chemists, who analyzed, as experts, some samples of prepared lard, two of which were pure and the others purposely adulterated with cotton-seed oil and tallow. The result, as published by the Board of Trade Committee, indicates, by reason of the widely different results attained by different chemists, that there is no sure method of determining the presence of beef-fat crystals when mixed with hog-fat crystals; at least, that the chemists employed did not succeed in finding such a method. It is claimed that fat crystals differ when found in the hog and in the cow. It is a desirable point to settle, as it has an important bearing on the future adulteration of lard. If tallow and cotton-seed oil can be employed without detection in the adulteration of lard, it may be taken for granted that they will be so employed.

AN IRON THEATER.—A company is said to have been formed to carry out a "reformed theater," a model of which has recently been exhibited. Every thing possible about this theater (says the *Pall-Mall Gazette*) is of iron. All the scenes and curtains are lifted and lowered by hydraulic machinery, so that only about one sixth the number of men usually required suffice to "work" every thing, and the scenes can be changed in a surprisingly short time. The stage floor is in a number of rectangular sections, each of which can be raised and lowered independently, by hydraulic power. This, it is said, gives power to produce many very remarkable and picturesque effects which are impossible with ordinary stage machinery. Thus the stage may be made to slope backward and downward, so that the audience may suddenly find themselves at the top of a mountain range, looking down into a series of deep valleys.

TO DETECT ground rice in buckwheat flour: Heat a quantity of concentrated lye, mixed with water, in half as much flour, to the consistency of paste. If there be rice flour in it, the mixture will appear yellow, and on the addition of muriatic acid, white; if buckwheat alone, the paste will be dark green, and with muriatic acid added, red. On pouring spirits of wine containing muriatic acid over the mixture, if rice flour be contained in it, it will be colorless; if buckwheat alone, brownish. Seen under the microscope, there is no difference in the starch grains of the rice and the buckwheat. —*Dr Walzen Mueller.*

GOOD HEALTH.

Insane Asylums.

The insane asylums of this country have recently challenged public attention. Their management has been much discussed, often unfairly and hypercritically, but there is no doubt that these institutions, while magnificent in architecture, and while grandly generous in endowment and support, are false in organization, and generally fail to cure. Among their faults we mention, first, their vast size and the great number of patients under one management. With the highest sense of duty on the part of the superintendent, minute and frequent study of the individual case is impossible. Every thing falls into routine, and is left to the care and management of attendants, who are rarely persons of intelligence and sympathy.

The practical outcome of the great insane asylum is that hundreds of persons, many of whom need the most careful, discriminating study, are treated much as farmers treat unruly cattle—they are kept inside of a high fence and not allowed to hurt each other. With the exception that the insane are dosed with anodynes to make them sleep, it would be somewhat difficult to point out the differences between the usual management of the insane and the management of unruly cattle.

We mention next, though it stands first in practical importance, the utter seclusion of the inmates of these asylums from the outside world. Interested for years in the management of these institutions, the conviction constantly grows upon us that our insane will never receive justice, they will never be wisely and tenderly managed, until the light of day is let into their places of confinement.

The reason most frequently given for interdicting correspondence is that the patients might trouble their friends with improper letters. This is not a good reason. No one with a spark of human sympathy would give such a reason. The patient, sick of typhoid fever at home, and abandoned because he was a trouble to his friends, would be a parallel barbarity. In civilized life, the convenience of the well always gives way to the necessities of the sick. The ease of the sick brain should be no exception. We do not now argue this point; we only wish to say that our insane asylums can never be brought into harmony with civilization until a United States mail-box is within easy reach of every patient, to be opened only by the regular mail-officer, with the usual severe penalty unsparingly enforced upon all interference with the letters deposited therein—*Dio Lewis's Monthly.*

CREMATION.—Doubters are now convinced that the cremation movement will triumph. It is right; it is honest; it is clean. It is quite as sentimental as burial in the ground. It is right, because it removes from millions of the poor a great load. It is honest, because the soil contains only a small percentage of the precious materials which can be appropriated by our bodies. To withhold these precious atoms from general circulation for thirty or forty years is not honest. Through cremation these atoms are all returned at once to the atmosphere, and quickly reach the soil. It is clean, as every one knows. Graveyards have long been a detriment to the health of the living. Water circulates through the earth as blood circulates through the body. The impurities of graveyards find their way into this general circulation. A beautiful urn, containing the dust of the loved one, may be kept in some sacred place in our home.

TO CURE WARTS.—There are several ways by which these troublesome excrescences may be removed, as follows: Burn a piece of linen or cotton on any piece of steel, and rub the moisture left on the metal by the burning on the wart three or four successive times. (2) Rub the wart with a strong solution of potash till it disappears. (3) Wet gum ammoniac and rub it on the wart at night just before going to bed. (4) Cover a few sprigs of arbor vitæ with hot water; when the tea is quite strong, pour off, and bathe the warts with this, or crush the juice of the leaf directly on the wart three or four times a week, till it disappears. (5) Take 5 cents' worth of muriate of ammonia, wet a crystal in water, and apply several times during the day. (6) Cover the warts with baking soda, wet with water and tie them up. A few applications will remove them.

DEATH FROM THE SCRATCH OF A CAT.—On Tuesday, Sir John Humphreys held an inquest at Mile End, London, on the body of Louis Cain, aged 73. John Cain, 94 Malpin street, Mile End, Old Town, stated that deceased was his wife, and about three weeks ago she went to put the cat in the back-house, and in doing so the cat scratched her on the hand. The deceased afterwards became unwell, and went and saw a doctor, who prescribed for her, but she got gradually worse, and died on Tuesday morning. Previous to the scratch the deceased was in good health. Mr. Porter, surgeon, stated that when he saw the deceased she was suffering from an injury between the thumb and first finger, and erysipelas supervened. The cause of death was pyæmia, consequent upon the scratch. The jury returned a verdict of "Accidental death."—*Cardiff Mail, October 13th.*

"WHAT IS ONE MAN'S MEAT IS ANOTHER MAN'S POISON."—Good beef, good bread, exercise, sunshine, pure air, temperance, cleanliness, abundant sleep, a cheerful temper, and a hundred other things, are every man's meat, and no man's poison. It is true there are some things which one man can bear and another can not, but they are of doubtful utility. If you keep to the safe and good in food and drink, there is no truth in the old saw that "What is one man's meat is another man's poison." This old saw is made to cover a multitude of dietetic sins. Thousands of persons starve themselves into thinness, paleness and nervousness, by living on white bread and sweet things, and sleeping too little. Oat meal, cracked wheat, graham bread, and beef, with plenty of sleep, would make them plump and ruddy.—*Dio Lewis.*

LEARN TO LAUGH.—Blessings on the laughers, no matter of what style. Of course we all like ha-ha-ha, and we don't like he-he-he, or ho-ho-ho, or haw-haw-haw; but give them all a welcome. The worst of them are a thousand times better than the whiners. Hearty laughter is better than pills for dyspepsia, better than chloral for neuralgia, and better than balsam for consumption. Come on, brothers and sisters, with your ha-ha-ha, and your he-he-he, and your ho-ho-ho, and your haw-haw-haw, and all the variations; you are welcome. But you long-faced, whining, groaning wretches, avaunt! I would rather have the cholera come this way than you. Why don't you cut your throats? I will sit on your case as a juror, and bring in a case of justifiable suicide.—*Dio Lewis.*

ADULTERATIONS OF TEA.—In the *Sanitary Engineer* of June 1, 1880, is the statement that 7,000 chests of adulterated tea have been recently burned by order of the British government. An analysis of many samples, taken at random, showed 65 per cent of adulteration. In each 100 pounds of tea there were 65 pounds of poisonous adulterations. Eleven different poisons were detected, some of them deadly. Probably the worst of the Chinese teas come to America. The Chinese know that the British government watches and analyzes, while we Americans ask no questions. A large percentage of the stomach pain and indigestion among American women may be traced to tea.

TEA.—In the London *Medical Times* appears the following paragraph: "Dr. Heath, of Newcastle, has been the last to raise his voice against tea. But it has long been a fact familiar to us that tea is a most fruitful source of dyspepsia. Among the vast numbers of poor women who frequent the patient-rooms of our London hospitals, we should not be far wrong in saying that two-thirds are suffering from dyspepsia. This dyspepsia almost invariably arises from two causes—the want of proper food, and the abuse of articles like tea, which stay the craving for food, but which aggravate the consequent conditions of the digestion.

BED SORES may be prevented by the following precautions: Keep the sheet below the patient perfectly smooth; wash the parts where the bone is prominent, daily, with soap and warm water, dry them well, rub them over with a little spirits of wine or whisky, to harden the skin; change the patient's position frequently; never let him lie on a blanket.—*For E. M, M.*

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SAN FRANCISCO:
Saturday Morning, Nov. 10, 1883.

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Passing Events.

THE several rainy days of this week bring us to the consciousness that winter is really here. It is warm and mild in these latitudes, but in the mountains the snow will soon drive all the proprietors into winter quarters. There is very little new to report from the mining regions of this state. Work is being continued in the various districts. The famous debris suit is still pending, but a decision is daily expected. The organization of a local "Manufacturers' Association" is noted in another column. Diggings are announced to have been discovered on a tributary of the Skeena river, B. C., where $20 to the hand is the yield; but, as usual with such diggings, they are a long way off and the climate is very severe. Still, some men will winter up here this year.

The annual report of the Director of the Mint shows that the gold received and operated upon during the year was valued at $49,000,000, while the silver amounted to nearly $39,000,000. The coinage for the year was valued at $66,200,704, the total gold coinage being $35,936,927 and the silver $28,835,470, of which $28,111,119 was standard dollars. The profits on the coinage of silver dollars amounted to $3,701,331, and the silver profits of the last five years amounted to $13,860,310. The silver circulation, the Director says, is in excess of the requirements, and he expresses a belief that the equal coinage of both gold and silver by all nations is desirable. He suggests that Congress should consider the question whether the law directing the monthly coinage of two millions of silver dollars should not be modified or repealed.

A New Ore Concentrator.

A new ore concentrator, of that class usually known as percussion tables, has been patented through the MINING AND SCIENTIFIC PRESS Patent Agency, by Charles C. Rueger, of this city. The machine is provided with a series of triangular tables having a durable and smooth working surface. These, with the other operating parts, are arranged radially around a vertical shaft securely fastened to it in any desired manner, and to each other. A suitable inclination is given to the tables, placing the three corners of each at different levels, but corresponding in each table, being highest at the center shaft, with the radial line of greatest pitch along one side of the table, so that only alternate outside corners of the triangles will be in the same line.

The triangular tables are made of wood, in an iron frame, the wood being covered with rubber cloth. A sufficient number of these tables are arranged around the common central shaft, to close the circuit, and thus form a conical aggregation of tables. The several tables are then joined together, provision being made, however, for regulating the inclination of the planes. Cast-iron gutter-shaped bars, which unite the angle iron side-bars, form the periphery of the conical aggregation of tables. The gutters also serve as receptacles and conduits for the various products flowing from the concentrating planes. For each product a separate compartment is provided in the gutter, by putting into them a sufficient number of partitions. The products of concentration make their exit from these compartments through holes in the bottom of the gutter connecting with outflow pipes, which conduct the product to receptacles suitably disposed underneath the machine.

All the outflow pipes for the poor or waste product are run to the bottom of the central shaft, and are firmly fastened to both gutter and shaft, so as to serve as a stay or brace to the table, increasing the rigidity of the structure and preventing injurious vibration when in operation. The discharge ends of these pipes are led in different directions, carrying the valuable product one way and the waste another.

The supporting frame for the concentrator is made of one or more arcs of cast iron, bolted together for a full series of tables to form a ring, and it is provided above and below the tables with bearings at the center, for the upright shaft, to which the tables are attached. On this cast-iron frame is the driving mechanism of the concentrator, consisting of a short horizontal shaft, with belt-pulley and cam. The cam, rotating, pushes against a bar projecting from one of the tables, thus acting against the pressure of a spring, so disposed that when the bar is released from the cam-face the table recoils against one or more abutments.

The rapid reciprocating action of the concentrator by the cam and spring effects the agitation of the pulp, and the percussion effects its diagonal course over the plane. In this manner one cam will drive a number of tables. By having a cam at each end of the shaft, and making the latter common to two frames, two full series of tables can be driven with one belt, and with proportionally less power than in series, giving economy of space, power, and motive mechanism.

The action of the Rueger concentrator most closely resembles that of the Rittinger side-percussion table, in so far that the ore pulp, while flowing down an inclined table, is agitated by an oscillating motion given to the plane, which allows the particles to settle in the order of their density. At the same time they are subjected to a lateral percussion action which causes them to take a diagonal course on the plane in flowing down toward the discharge edge.

The Rittinger table, however, is a rectangular parallelogram, or a series of such parallelograms set parallel to each other, suspended from rods and inclined at an angle of from three to six degrees, the upper and lower edges or rims being horizontal, making the line of greatest pitch run parallel to the long side. In Mr. Rueger's invention the concentration table is of triangular form, a series of them radiating and inclined from a common central axis, and the line of greatest inclination running from a point on one of the radial sides to the opposite corner or angle of the triangular table, so that the three angles of the table are at different elevations, the most acute central angle being the highest. In this invention, also, the ore pulp runs upon the tables through openings in the circular trough-shaped distributer which is common to the series of tables and affixed to the central axis. The pulp spreads in a thin layer over the table, and runs down towards the lowest corners, subjected meanwhile to an agitating action which facilitates the settlement of the denser particles, and a percussion action which causes the pulp to travel towards the higher outside corner of the triangular plane. This agitating and percussive action is not uniform over the length of the table, as in the Rittinger machine, but accelerative, increasing as the pulp approaches the discharge edge. The motion, also, is not in straight lines, as in the Rittinger machine, but in arcs of concentric circles, which induces a centrifugal action on the ore particles favorable to separation. The denser ore particles traveling most slowly downward, by virtue of their greater adhesion to the surface of the plane, are subjected longest to these actions, which causes them to take a more diagonal course than the less dense particles. In their course they are met by currents of more or less clear water flowing from perforated pipes extending from the central distributing trough to the higher outside corners of the tables. The flow of this clear water being naturally towards the lowest corner, it must cross the course of the concentrates, carrying the less dense particles still admixed therewith towards their proper place of discharge. The three usual products of concentration—tailings, concentrates and "middlings"—flow into separate compartments of the gutter attached to the lower edges of the triangular tables, and then through orifices and discharge pipes into suitable receptacles, as before described.

Mining Products.

Many persons imagine that the mines of the country are represented solely by the gold and silver yield. Aside from gold, silver, copper, lead, iron and coal, there are very many substances obtained by mining which are added yearly to the products of the country. We take a table from a recently published government work on the "Mineral Resources the United States," which gives the yield for the year 1882 of a number of substances for which mining is carried on as follows:

VALUES OF THE METALLIC PRODUCTS OF THE UNITED STATES IN 1882.

Pig iron, spot value	$106,336,420
Silver, coining value	46,800,000
Gold, coining value	32,500,000
Copper, value at New York City	16,038,091
Lead, value at New York City	12,624,550
Zinc, value at New York City	3,046,020
Quicksilver, value at San Francisco	1,487,537
Nickel, value at Philadelphia	309,777
Antimony, value at San Francisco	12,000
Platinum, value at New York City	1,000
Total	$219,756 004

VALUES OF SOME OF THE NON-METALLIC PRODUCTS OF THE UNITED STATES IN 1882—ALL SPOT VALUES, EXCEPT CHROME IRON ORE.

Bituminous coal, brown coal, lignite and anthracite mined outside of Pennsylvania	$70,070,487
Pennsylvania anthracite	70,550,094
Crude petroleum	23,704,698
Lime	21,700,000
Building stone	21,000,000
Salt	4,320,140
Cement	3,072,750
Limestone for iron flux	2,310,000
Phosphate rock	1,147,830
New Jersey marls	540,000
Crude borax	338,903
Mica	250,000
Crude barytes	160,000
Chrome iron ore, value at Baltimore	100,000
Soapstone	90,000
Manganese ore	52,500
Asbestus	30,000
Graphite	34,000
Sulphur	21,000
Cobalt ore and matte	15,000
Precious stones, uncut	12,500
Asphaltum	10,500
Corundum	6,250
Pumice-stone	1,750
Total	$226,156,402

RESUME OF THE VALUES OF THE METALLIC AND NON-METALLIC MINERAL SUBSTANCES PRODUCED IN THE UNITED STATES IN 1882.

Metals	$219,756,004
Mineral substances named in the foregoing table	226,150,402
	$445,912,406
Fire-clay, kaolin, potter's clay, common brick clay, terra-cotta, limestone used as flux in copper and lead smelting, iron ore used as flux in lead smelting, pyrites (for acid making), zinc white made directly from ore, marls (other than New Jersey), apatite, gypsum, tin ore, bismuth, arsenic, iridosmine, mill-buhrstone and stone for making grindstones, lithographic stone, talc (other than "soapstone"), quartz, feldspar, fluor-spar, terra-alba, chalk, crude mineral paints, nitrate of soda, carbonate of soda, sulphate of soda, native alum, ozocerite, mineral soap, strontia, etc.—certainly not less than	8,000,000
Grand total	$453,912,400

The grand total might be considerably reduced by substituting the value of the iron ore mined for that of the pig iron made; by deducting the discount on silver; and by considering lime, salt, cement, borax, etc., as manufactures. It will also be remarked that the spot values of copper, lead, zinc, and chrome iron ore are much less than their respective values after transportation to market.

Blasting in Mines—No. 14.

Judson Powder.

This powder has had as great success as the Giant. The latter company introduced it first on gravel claims, blasting banks of gravel, cement, pipe-clay, etc. Herein the powder met with surprising success, on account of the simultaneous explosion of the whole mass. The attention of railroad men was soon called to Judson powder, and after careful tests it was adopted by the Central Pacific and Southern Pacific railroad builders, under J. H. Strobridge, Esq. When the Oregon railroads were started, the Judson underwent there another careful test by the Superintendents of Construction of the Northern Pacific, Oregon Railway and Navigation Company, Oregon and California railroad, and Oregon and Pacific railroad, and was declared and accepted as the best con-grade explosive.

Directions for Using.

1st. As to quantity—Use the same as with common black blasting powder, until you are satisfied less will do the work.

2d. As to exploding—The powder will explode with a triple force Giant-powder cap. It is a great advantage to place the cap in the middle of the charge instead of the top. This produces a surer and better explosion. Quintuple caps are still preferable. Railroad men use always a part of a cartridge of Giant powder.

3d. As to keeping—The powder must be kept in a dry place, and not exposed to the air. The company advises miners, when they receive the powder in bulk, and not in cartridges, to empty a case at a time into tin powder-cans, which must always be kept well closed, and use the powder from these cans and not direct from the cases, as the powder attracts moisture when they are left open.

4th. As to tamping—The same rule applies as with common powder; the more and better it is tamped the greater the execution.

5th. See that the powder is not put into bore holes with water in them, as it damages from wet about as readily as common blasting powder.

6th. For bank blasting—No special instructions can be given. Under high and heavy banks stack the powder in various places in the "tees," and when possible fire with battery. In "toe and bottom" shots, tamp close to the powder, in order to get the shattering effect.

For Stump and Tree Blasting.

Since the introduction of Judson powder, the railroad companies, farmers and others have applied it in removing stumps and trees. This has especially been the case on the before-mentioned Oregon railroads. Trees and stumps, no matter how large, are being blown hundreds of feet out of the way. To do the work the following directions should be followed:

1. Put down a hole, at an angle of about 30 degrees between the roots to a point under the center of the stump or tree; spring this hole with a cartridge of No. 2 Giant powder, by exploding the same at the bottom of the hole. This blast will produce a large cavity; charge this with Judson powder, and fire with a primer of Giant powder.

2. Dig a hole under the stump or tree, between the roots, put in a box with 10, 25 or 50 pounds of Judson powder, according to the size of the stump or tree; or, better still, put the Judson powder in a bag. The advantage of having the powder in a bag is that the hole has to be made between the roots, and deviates frequently from a straight course by the irregularity of the roots. A bag can easily be pressed into such hole to reach the center under the tree or stump, which could not be done when the powder is in a box. After having put a small primer of Giant powder, with fuse and cap attached, through a hole into the box or bag of Judson powder, then tamp the hole with dirt. Experienced railroad men say that this is the easiest and cheapest way of removing the largest stumps.

The Giant Powder Company is making also a very strong Judson powder, of two grades, calling the same F Judson and FF Judson. In tunnel and open-air blasting, those who have used it say it is fully as strong as any second grade nitro-glycerine powder. These two grades are considerably cheaper than the second grade nitro-glycerine compound.

HISTORY OF CALIFORNIA MINING.—The publication of the second one of the series of articles on this subject is unavoidably deferred to next week, when the series will be continued.

Manufacture of Charcoal in Kilns—No. 2.

At one end are two doors, one above and one below, both of which are used for the introduction of wood, at other times there is only the lower one. The discharge of the charcoal is made by the lower door only. These doors are generally five feet square, and are supported on hinges on a cast-iron frame. They are best made of cast iron, in two parts. Sometimes they are made of a single piece of sheet iron. The upper opening is sometimes the same size as the lower one and sometimes about thirty inches square, and is also closed with a sheet or cast iron door. On the sides, between the braces or buttresses, there are rows of openings, called vent-holes, regularly spaced, vertically and horizontally, for the introduction of the air necessary for combustion, and to allow the products of distillation to escape. Vertically there are three or four of these. Between the braces, horizontally, there may be only one row, where the braces are very near to each other; or two rows for the lower and one for the upper, or three in each row, as in Fig. 3. The number is regulated by the way the bracing is done. They are almost always placed one directly over the other. To each of these a name is given. The lower one is called the foot vent, the middle one the knee vent, and the upper one the shoulder vent. On the ends of the kiln the vents are placed less regularly than on the sides. Sometimes there is only one row, one above the other; sometimes one row not in line, as in Fig. 3, and sometimes there are more. From three to four vent holes are usually made in the lower doors. These openings are usually of a size to admit a single brick.

The wood is usually cut to a length of four feet, and laid flat, piled as closely as possible, so as to leave very few interstices. Stronger charcoal would probably be produced if it were placed on end, but the extra cost of labor to pile it in this way would more than compensate in expense for the extra quality. Four men, working one day, are required to fill a 45-cord kiln. The sticks are laid on the floor as closely as possible, putting the logs in the direction of the length of the kiln, and piling them in successive steps, so as to fill it up to the arch.

There are several methods of lighting the kiln. In Sweden, where these kilns were first used, they were always fired from a permanent structure in the center of the kiln, to which access could be had from the outside. In this country no permanent structure is made. When first used in New England they were lighted in one corner. The fire was then drawn along the long side, and so round the kiln on the outside of the wood, so that the heat acted directly on the walls. Such a direct exposure to the heat and pyroligneous acid rapidly destroyed the mortar in the walls, which became cracked, and after a short time the yield of the wood in charcoal was materially diminished. The lighting is sometimes done by a chimney left in the wood in the center of the kiln, from above, exactly as in the meiler, the fire being drawn down by the openings in the sides; this chimney may or may not connect with a channel leading to the discharging door. This method is used in the South and Southwest of the United States, and is practiced in Mexico, and is preferred when the kilns are very wide. It is considered by many to give the best results, both as to yield and quality of charcoal.

Sometimes the lighting is done by means of a channel built through the middle of the kiln, having an opening at each door. This is also filled with dry wood and shavings, which are lit from the back door. The fire is then drawn through the wood to the front door by properly manipulating the vents. When the fire has reached the front both doors are closed, as the whole kiln is then lighted. This method is called the *center burn*. In both these last methods as the, fire is generated in the wood, the heat does not affect the walls of the kiln. The time required for these methods is not more than half that of the first method.

That the charge is ready to be drawn may be ascertained by taking off the cover on the top and opening a few of the vents. If after two or three hours there is no appearance of fire or of smoke the kiln may be drawn. If the kiln is opened too soon water must be pumped in at once, as the charcoal would take fire.

The whole art of the process consists in closing the vent-holes at the proper time. As soon as the kiln is well lighted the two lower rows are closed. The vents of the upper row are closed little by little. Those of the middle in the upper row are usually closed first; then those from which the blue smoke comes in their turn. When the vents of the first row are being closed, those of the middle are opened, and so on. One man by day and one man by night can easily superintend five or six such kilns. He has little to do except to draw the fire regularly down, to watch the color of the smoke so as to close the vents at the proper time, and to close any cracks that may form.

The rectangular kiln is going out of favor, for the reason that there is so much space heated, with such thin walls, that the number of braces has to be very large to secure a tight kiln, and that when once cracked, it is almost impossible to repair it so as to make it tight.

Round Kilns.

The round kilns, Figs. 4 and 5, differ from the rectangular ones only by their shape. Fig. 4 shows the form usually employed among the bloomery forges of Northern New York; Fig. 5 is that employed for blast-furnace fuel in Vermont; Fig. 4 is built with vertical walls, and is braced with wooden posts and iron straps. Such kilns can be seen near Roger's Rock, on Lake George, and at Black Brooke, Essex County, N. Y. Fig. 5 is built with battered walls, which are 28 feet at the base and 26 feet at the spring of the arch, and has no bracing. In all other respects the kilns are similar. The arches of both these kilns are supported by iron rings at their base. Fig. 5 A shows the lintel of the discharging door; Fig. 5 B shows the shape of the cast-iron door E at the top of the kiln. They have three rows of vents, one at the base, with six courses of brick between each of the others. These vents are 2 by 4 inches and 18 inches apart. They are usually 28 to 30 feet in diameter at the base, and 26 to 28 feet at the spring of the arch. The vertical walls are 11 to 12 feet to the spring of the arch, and 1 foot thick. The arch is 8 inches thick and is laid in headers. Such a kiln will have about 300 cast-iron vents, which weigh about eight pounds each. Thus a capacity of from 40 to 45 cords requires more precautions in building when the walls are not battered, and besides the usual braces, must be hooped with strong iron bands. The doors are made of No. 10 sheet iron. The top opening is a cast-iron ring, which together with the lintel of the door weighs about 1,500 pounds. The wrought-iron bands around the kiln weigh about the same. They require about 36,000 brick. These kilns are usually built against a bank, so that the top can be reached from it.

The filling is commenced by placing pieces about .15m. diameter radially, leaving interstices for air-channels; above this, about .60m. of dry wood and brands are placed, leaving a space in the center about 1.20m. in diameter for a chimney, which is carried to the top of the kiln. The wood is piled horizontally, and packed as closely as possible.

With ordinary facilities, it takes four to five men one day to fill a 45-cord kiln with wood four feet long. Where butt-ends of logs are used, it takes 12 hours to fill a 35-cord kiln; but these can be tumbled in, and do not require much handling.

It takes from five to six days after all the vents have been closed to cool a kiln of from thirty-five to fifty cords. The covers of the doors are of sheet iron, and so long as there is any heat in the kiln it will be felt on these doors. As soon as these are cold, the kiln is cool enough to draw.

STATISTICS OF ROUND FURNACES.

CHARGING.			BURNING.			COOLING.	DISCHARGING.			
Time.	Day's Work.		Time.	Days Work.		Time.	Time.	Day's Work.		Per cent. of brands.
Days of 10 hrs.	Men.	Horses.	Days of 10 hrs.	Men.	Horses.	Days of 24 hrs.	Days of 10 hrs.	Men.	Horses.	
7	1	0	12	1	0	6	4	3	0	10

Diameter.....28 feet at base, 26 feet at top
Height to spring of arch.....12 feet
Capacity in cords.....50
Number of thousand brick.....31
Number of Vents.....176
Pounds of cast iron.....1500
Pounds of wrought iron.....1500

The chief objection to the rectangular and round kilns is their want of stability. The rectangular kilns require to be braced with wood and iron, while the circular kilns, which offer no advantages over the rectangular, must in addition be hooped with iron. This makes this kind of structure expensive in the first place. The less expensive structure, Fig. 5, does not last much longer. The contraction and expansion which the bracing is intended to prevent does take place, and after a time there will be numberless air-channels in the shape of cracks in the walls which can not be effectively closed, which will both increase the difficulty of management and decrease the yield in charcoal.

Kilns of this shape are being rapidly given up. It has been found much more economical to construct and to manage small conical kilns than large round ones, and these conical kilns are gradually taking the place of the large ones of other shapes.

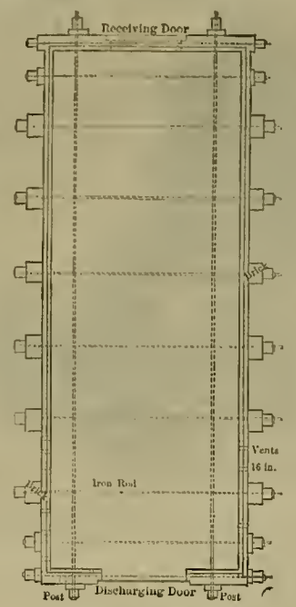
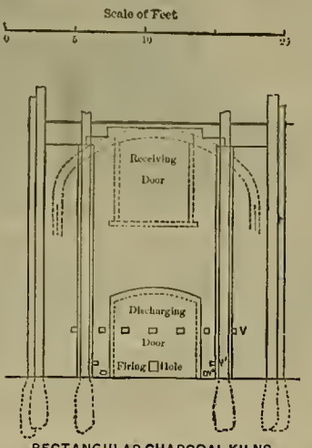


Fig 3



RECTANGULAR CHARCOAL KILNS



CIRCULAR CHARCOAL KILN

Fig.5 A.

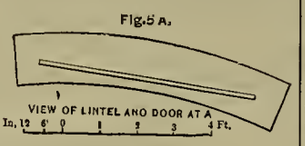


Fig.5 B.

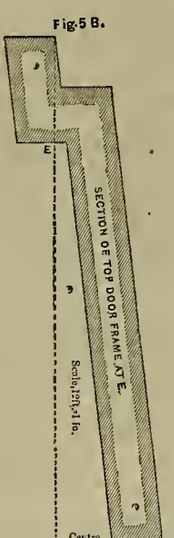
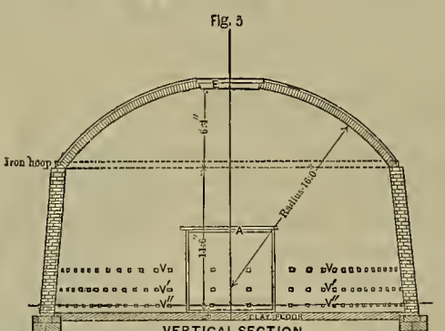


Fig. 5



VERTICAL SECTION

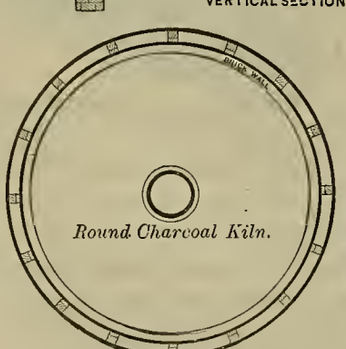
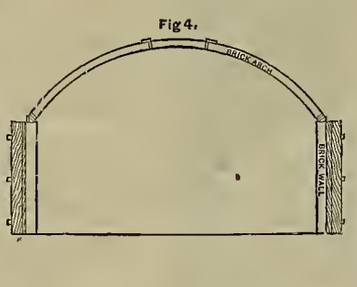


Fig 4.



RECTANGULAR AND ROUND CHARCOAL KILNS.

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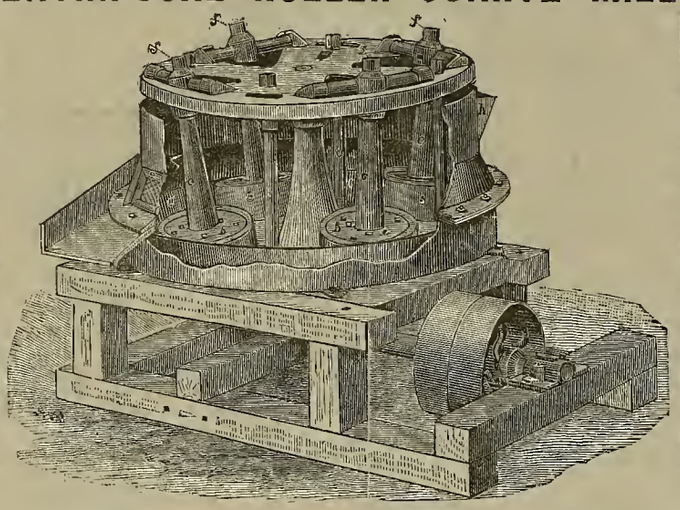
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1. The cost of same capacity is not more than one-half that of stamps.
2. Freight to mine one-fourth that of stamps.
3. Cost of erection at mine one-tenth that of stamps.
4. It runs with one-third the power per ton of ore crushed.
5. The wear is less than that of stamps.
6. The wearing parts are easily duplicated.
7. It has a much better discharge, and leaves the pulp in better condition for concentrating.
8. It is a better Amalgamator, saving fully nine-tenths of the gold in the mill; the balance can be saved on plates in the usual manner.
9. It is continually crushing; not like the stamp, using power to suspend it in air ninety-nine one-hundredths of the time, and the balance making a thundering noise, and accomplishing *comparatively* small results. It is a far in advance of the stamp mill as the present method of making flour with improved rolls is over the Indian's mode of crushing corn in a stone mortar.

PATTEN'S CONCENTRATOR.

This machine requires less power, less care or attention, and is less liable to get out of repair than any concentrator now in use. All of which any practical miner will comprehend when seeing it in operation.

The wear and tear is nominal, and the construction so simple that any miner can put it up and run it; and the low price brings it within the reach of all mill men, as it will save enough to pay for itself in any mill in a very short time. One machine will concentrate the tailings from a five-stamp battery.

SHINGLE MACHINES AND SAWMILL MACHINERY OF EVERY DESCRIPTION.

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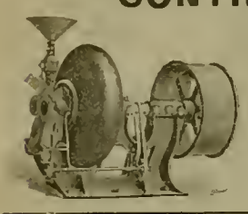
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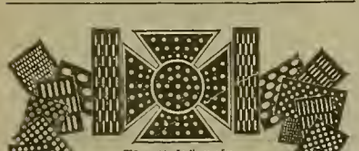
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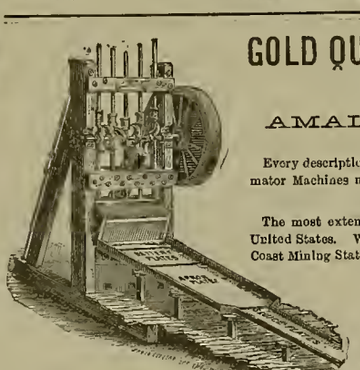
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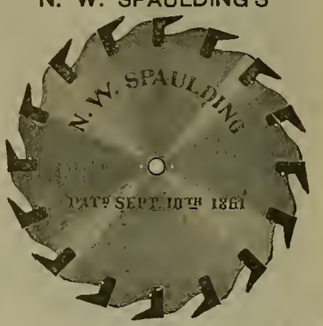
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California Wire Works.

Description of the New Factory and Plant.

The manufacturing shops of the California Wire Works are located near the seawall at North Beach, and occupy an entire block of land, bounded by Bay, Mason, North Point and Powell streets. Old Meiggs' wharf used to run through the center of their property, but, with the exception of a small portion of the old wharf that is about to fall to pieces from decay, there is nothing to point out the long pier built by Harry Meiggs, who at one time was so famous in Peru and Chili as a railroad-builder.

The California Wire Works bought the property in September, 1882, and in October commenced to build the foundations for their warehouses and factories. All the foundations are of concrete, of which there are over 50,000 cubic feet. The ground here has been filled in to the depth of twenty feet, below which is the hay sand and mud. Although the ground is generally well filled in, some spots were encountered which had been filled with tin cans, old boots, shoes, etc., and which involved a broad base of concrete, placed at considerable depth, in order to secure a good foundation.

Water.

The consumption of water for the use of the wire mill is very great, and at the old works was an item of considerable expense. In order to provide an ample supply, two artesian wells were sunk with good results, and a satisfactory amount of water secured at a depth of about 100 feet. A beautifully working pump made by Goss & Dow is used for pumping the water to a tank containing 20,000 gallons, placed on a tower 60 feet above the ground.

The Chimney.

In providing the foundation for the chimney, which is 100 feet high above its foundation and 11 feet 10 inches square at base, it was not deemed advisable to go very deep into the crust of filling which lay on the bay mud and sand. The filling at this point was of a very solid and compact nature; consequently, a concrete foundation was provided 16 feet square by 6 feet in depth, on which the brick chimney was erected, giving a load of about 1½ ton to the square foot. The settling took place quite uniformly, and to the depth of 4½ inches. From measurements made with a fine wire, suspended from the cap of the chimney and inside the flue, it was found that the deflection caused by the heat of the sun shining on one side of the chimney was three-fourths of an inch.

Boiler Room.

There are four boilers, each 16 feet by 54 inches, with 54 3½ inch tubes each, with ornamental fronts, and fitted with smoke-consuming apparatus and all the most recent improvements. The boilers are well planted, in carefully built brickwork, and can be reached equally well front as rear, and well lighted all around. The building is 45x35, entirely fireproof, being of brick and iron.

Engine Room.

A horizontal Corliss engine, 24x48 inches, made by Hinckley, Spier & Hayes, of this city, is bedded on a heavy concrete foundation, and works smoothly and with great regularity. It is nicely finished and well proportioned, and reflects credit on the builders. The fly-wheel is 18 feet diameter, and weighs 23,000 pounds. The driving pulley is 10 feet diameter by 50 inches face, and drives a ponderous treble leathern belt 4 feet wide and 80 feet long. This is the largest leather belt ever made on the Pacific Coast. It runs perfectly true, transmitting 300 horse-power with apparent ease and grace. Mr. H. B. Cook, the manufacturer, states that it took 56 hides to make it, and weighs 938 pounds.

The engine is surrounded by a handsome wire railing, to keep visitors out of danger, and the engine-room, which is 30 by 45 feet, is finished off in natural wood, varnished. It is well lighted, as clean as a parlor, and is perhaps the most tastefully finished engine-room on the Pacific Coast, if not in the United States.

The engine is set up ten feet above the floor, which, as well as the walls, is built of concrete. On the floor are the condenser and pump used in pumping the sea water from the bay beyond the seawall, where it is clean and pure, to the heater in the engine-room, where it serves the double purpose of condensing the exhaust steam and supplying the new salt water swimming baths with hot salt water. About 18,000 gallons of salt water are pumped every hour, through a cast-iron pipe ten inches in diameter and 1,300 feet long, by a very smoothly working Dow pump. A similar and independent pump is used to drive the salt water after it has been heated, to the swimming baths.

Machine Shop.

Leaving the engine-room, we pass into the machine shop, 45x100 feet, the most admirably lighted of any shop of the kind we have ever seen. It is well equipped with a great variety of lathes, planers, shapers, drilling machines, bolt cutters, etc.; and the general arrangement of the shop with respect to light, disposition and care of tools, is very creditable to the master mechanic of the works, Mr. J. H. Neil, under whose supervision all the machinery of the company has been erected. From the machine shop we pass into the blacksmith shop, in which are the fires and forges, and where much of the heavy railing-work made by the company is done.

The Carpenter and Pattern Makers' Shops

Are immediately over the machine shop, and adjoining the latter is the pattern room, fitted up with shelving full of patterns, these together occupying a space of 45x120 feet.

Wire-Working Department.

Passing over a bridge, we entered the wire working and wire weaving departments. The former occupy a room 40x215 feet, and the latter a room 19x90 feet. Here we saw wire worked up into every conceivable shape—massive gates and guards for prisons and insane asylums, and delicate flower baskets for a lady's conservatory; large summer-houses and aviaries, and small mouse traps and trap cages—every conceivable kind of ornamental garden work, fire fenders and floral designs.

Wrought and cast iron railing is being made a specialty; and there are here a great variety of special tools employed in the manufacture of railing. Many of the designs are entirely new, while others are taken from samples of work done in the 15th or 16th century.

The wire and iron working department gives employment to a great many boys, who are learning a trade at which they will be able to earn a good living. In an adjoining room are a quantity of looms used in weaving all kinds of wire cloth. Some of them were at work on heavy cloth or screen with holes three-fourths inch square, and made from wire three-sixteenths inch thick, while others were weaving cloth from fine brass wire, and having 3,600 holes to each square inch.

Wire Rope Factory.

The next place we visited was the flat-rope sewing department. Here are manufactured the long, massive flat wire ropes used for hoisting ore from the deep mines. The manufacture of flat rope requires great care, in order to secure uniformity of strain on each of the strands and make the rope run straight and even.

The main rope factory, where the wire is spun into strands and the strands into rope, occupies a building 275 feet long by 40 feet wide, and is filled with very ingenious and somewhat noisy machinery, all of which is the invention of Mr. A. S. Hallidie or his brother. A rope has just been manufactured 22,000 feet long, in one piece, one and five-sixteenths inch diameter, and weighing nearly 60,000 pounds. It is intended for the Market Street Railway Company, and is the longest and the heaviest rope ever made in or brought to this city. We also saw a fine cord being made which measured one-sixteenth inch diameter, and in which were forty-two wires as fine as a lady's hair; and when we compare this little cord with the massive rope before mentioned, it will give some idea of the range in wire-rope making. We ascertained that in the former rope there were 2,636,400 feet of single wire (nearly 500 miles) 1-14 inch diameter, and capable of sustaining a load of 1,200 pounds.

Great attention has been paid to the manufacture of wire cables for street railways. Mr. Hallidie naturally watches with a jealous eye all such ropes, being naturally anxious that the success of his invention of cable railways should not be impaired by imperfect cables. At this time the wire-rope department is engaged in manufacturing steel-wire cables for the Clay Street Hill Railroad Company, 11,000 feet long; for the Presidio and Ferry Railroad Company, 13,000 feet, and for Geary Street Railroad Company, 16,500 feet, besides many other ropes for mining purposes.

Barbed Wire-Fence Making

Is carried on in an adjacent building, and we were shown the *modus operandi*. This part of the business of the company is stopped at present, owing to the dispute between the owners of the patents and licensors, Washburn and Moen Mfg. Co., and the licensees. They have facilities for making fifty tons per month, and expect to start up again very shortly.

Wire Mill.

All the different branches of manufacture of the California Wire Works, as well as the demand from outside sources, are supplied with wire from the wire mills of the company, which are situated adjacent to the other works; and they have been constructed with the utmost care.

All the wire is drawn cold, through steel dies having holes in them of the proper size and form needed for the purpose, and in order to fit the solid iron rod for drawing down, it has to be carefully annealed; and afterward all the oxide and scale are removed by acids. The rod is then covered with a gelatinous coating, and is ready for the wire drawer.

The machinery is very massive, the driving shaft being 6 inches diameter. There are 8 different trains of revolving blocks used for drawing wire, containing 236 blocks, and the capacity of the mill is 400 tons per month. All sizes of wire are made, from ⅜ inch to 1-140 inch thick.

The wire made at these mills is principally from Bessemer and Siemen Martin steel, although a great deal of Swedish wire is also drawn. The tempering and annealing is done in furnaces specially built for the purpose, of the most approved plan; and after the wire is cleaned with acid, the acid has to be all evaporated from the wire, which is done in a drying and baking house of brick. All the lifting of the wire and rods is done by hydraulic cranes, and every thing is provided that modern practice permits, to save labor.

The general design of the works was made with a view to compactness and completeness, and the engineering details and designing has been done by the company's engineer and draftsman, Mr. A. Grutter, in a manner eminently satisfactory to the Board of Directors.

Galvanizing works are being erected on the company's property on North Point street, for the purpose of galvanizing much of the wire produced at the company's mill, and a foundry is being constructed on the Powell street side of the property.

Warehouse.

The large fireproof warehouse of the company occupies almost the entire length of Mason street between Bay and North Point streets. It is 235 feet long by 40 wide, two stories, built of brick and iron. There are about 1,500 tons of merchandise in it at present, besides this warehouse are sheds, in which are stored about 700 tons additional. The company has 1,500 tons of steel rods on hand, from which to make wire, and about 500 tons on the way.

The stockholders have paid in $500,000, and judging from the buildings, plant, real estate, and material on hand, they must have a good deal more than that invested in what promises to be one of the leading and profitable industries of the Pacific Coast, furnishing employment to 150 men, many of whom earn as high as $30 per week at piecework. Of these over 100 are men of family; consequently it is safe to assume that the industry gives bread to 550 souls.

Testing Room.

Before any wire is put into the hoisting rope or railroad cable, it is very carefully tested for tensile strength, torsion and bending, and in a room set apart specially for the purpose there are machines and apparatus specially made for the purpose. While there we saw several wires undergo the ordinary test, which seems very thorough and exhaustive.

Fire Protections.

The provisions against damage by fire are very complete. Four-inch mains run all around and through the grounds. There are six fresh water and six salt water hydrants in convenient locations. A tank of 20,000 gallons supplies the fresh water pipes, and from the four mains smaller pipes are run throughout the works, and have fire-cocks and hose always ready for use. The water supply has a head of sixty feet. The salt water supply is taken from the bay by means of a ten-inch main and a very heavy fire pump, which throws one six-inch stream or four three-inch streams with tremendous force. A one and a fourth stream was thrown over the chimney, 100 feet high.

IF YOU want a lubricant that will run any thing cool write CHARLES J. WOODBURY, GENERAL MANAGER LUBRICATING DEPARTMENT CONTINENTAL OIL AND TRANS. CO., for "Lubrice." It is the best compound-grease in the market. Shipped in 5, 10 and 25-pound cans, half barrels and barrels. Warranted to give satisfaction. Observe the numbers: No. 2 is soft for outside work; No 3 is medium soft; No. 4 is medium hard; No. 5 is very hard, where unusual lubrication is demanded. Send for Catalogue of Lubricating Oils.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

TRUE Temperance

Is not signing a pledge or taking a solemn oath that cannot be kept, because of the non-removal of the cause—liquor. The way to make a man temperate is to kill the desire for those dreadful artificial stimulants that carry so many bright intellects to premature graves, and desolation, strife and unhappiness into so many families.

It is a fact! BROWN'S IRON BITTERS, a true non-alcoholic tonic, made in Baltimore, Md., by the Brown Chemical Company, who are old druggists and in every particular reliable, will, by removing the craving appetite of the drunkard, and by curing the nervousness, weakness, and general ill health resulting from intemperance, do more to promote temperance, in the strictest sense than any other means now known.

It is a well authenticated fact that many medicines, especially 'bitters,' are nothing but cheap whiskey vilely concocted for use in local option countries. Such is not the case with BROWN'S IRON BITTERS. It is a medicine, a cure for weakness and decay in the nervous, muscular, and digestive organs of the body, producing good, rich blood, health and strength. Try one bottle. Price $1.00.

DELINQUENT SALE NOTICE.

Seaton Gold Mining Company.—Location of principal place of business, San Francisco, Cal.; location of works, Drytown, Amador county, Cal.

NOTICE.—There is delinquent upon the following described stock, on account of assessment (No. 4) levied on the 27th day of September, 1883, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Martin, A, Trustee	34	5,000	$500 00
Martin, A, Trustee	35	5,000	500 00
Martin, A, Trustee	38	5,000	500 00
Martin, A, Trustee	42	5,000	500 00
Martin, A, Trustee	43	10,000	1,000 00
Martin, A, Trustee	48	2,900	290 00

And in accordance with law, and an order of the Board of Directors, made on the 27th day of September, 1883, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, No. 224 California Street, San Francisco, Cal., on MONDAY, the 19th day of November, 1883, at the hour of 1230 o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

CHAS. T. BRIDGE, Secretary.

OFFICE—224 California St., San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company.

San Francisco, November 2, 1883.

At a meeting of the Board of Directors of the above named company held this day, Dividend No. 60, of twenty five cents (25c.) per share, was declared, payable MONDAY, November 12, 1883, at the office in this city, or at the Farmers' Loan and Trust Company, in New York.

WILLIAM WILLIS, Secretary

OFFICE—Room No. 29, Nevada block, No. 309 Montgomery street, San Francisco, Cal.

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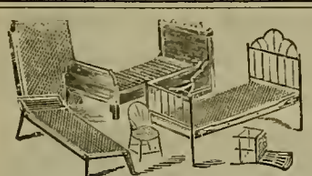
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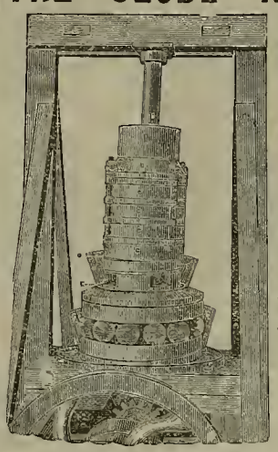
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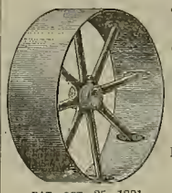
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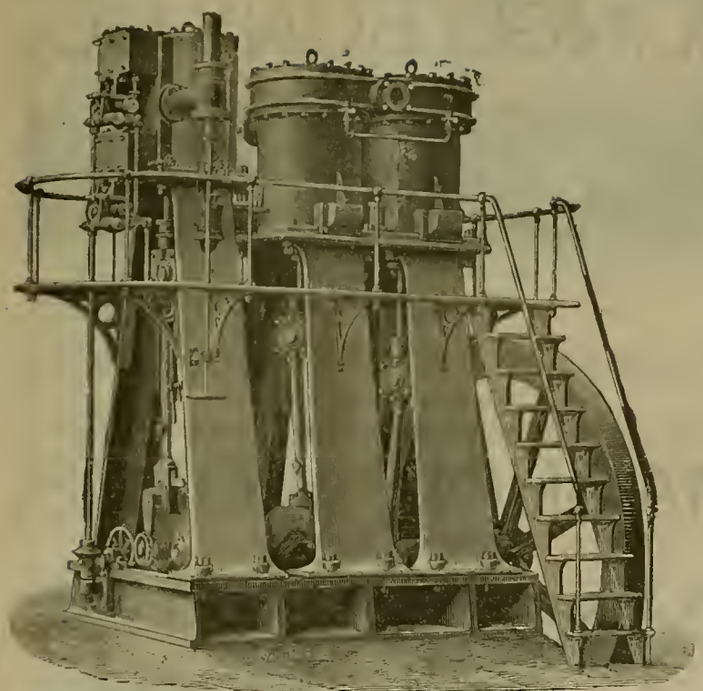
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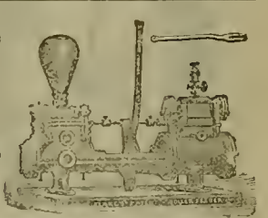


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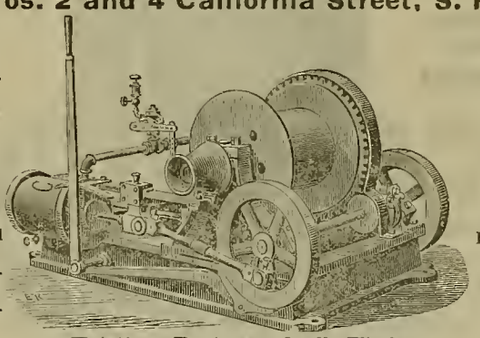


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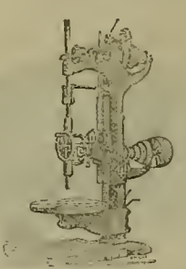




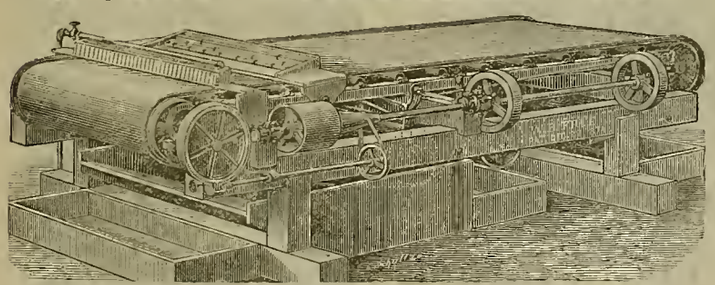
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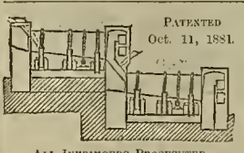
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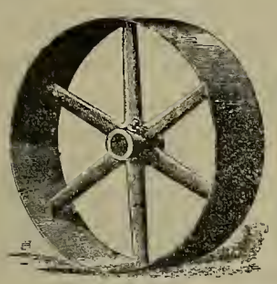
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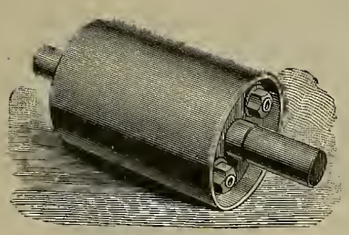
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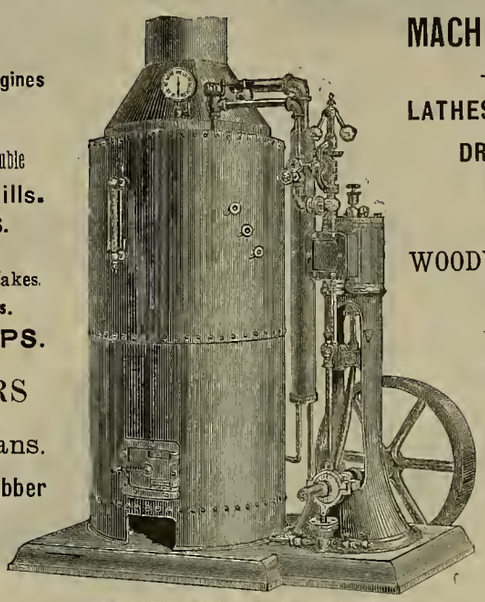
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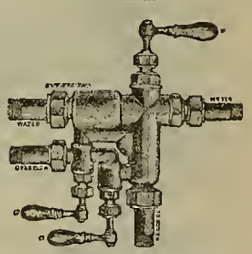
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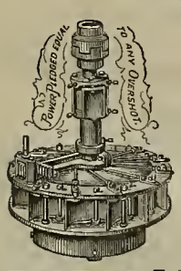
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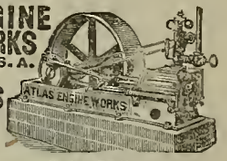
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SAN FRANCISCO, SATURDAY, NOVEMBER 17, 1883.

VOLUME XLVII Number 20.

Blasting in Mines—No. 15.

Explosive Gelatine.

Nobel's latest invention, explosive gelatine, something stronger than even the strongest dynamite or giant powder, is a substance of which little is known on this Coast, as yet, though the Giant Powder Company own the patent rights. It is, as the name implies, a compound of nitro-glycerine and gelatine. The gelatine will take up some 95 to 96 per cent of the nitro-glycerine. In this form it is a rubber-like substance, soft and pliable, and is made up into cartridges of cylindrical form ready for use. These cartridges are rolled up in oiled paper, and may be handled like ordinary cartridges. As little is known here of this powerful explosive, it will not be out of place to quote from the reports of the engineers of the great St. Gotthard Tunnel, in Switzerland, some data about the relative strength of some of the high explosives manufactured under Nobel's patents in Europe. This information is from official sources.

In most of the numerous tunnels of the St. Gotthard railroad explosive gelatine was used, after once its superiority was established. Careful investigations were made about the relative value of either explosive, with the following results:

In the Pfaffensprung tunnel—one of the circular tunnels in which the hardest granite on the whole line was met—one cubic yard of rock required, in the lower heading (cross section, 8'x9'), 5.5 lbs. of dynamite. In the same lower heading (cross-section, 8'x9') 3.8 lbs. gelatine. In the upper heading (cross-section, 9'x9'6") 3.1 lbs. of dynamite. In the same upper heading (cross-section, 9'x9'6") 2.1 lbs. of gelatine; which shows that the quantities required have the proportion of explosive gelatine: Dynamite = 1: 1.43.

In the great St. Gotthard Tunnel (9½ miles long) one cubic yard of rock required (cross-section of advance heading 8'x9') 6.4 lbs. of dynamite, but only 4.2 lbs. of explosive gelatine, which is a proportion of 1: 1.51.

Mr. Bossi, the chief engineer of the contractor of the great tunnel states, that where 1 lb. of explosive gelatine was sufficient to produce a desired effect, it required 1.10 lb. of pure nitro-glycerine, or 1.50 lb. of dynamite No. 1, or 2.15 lbs. of dynamite No. 2 or No. 3, or 4.50 lbs. of common black powder.

The experience of the engineer in charge of the Freggio Tunnel—another of those circular tunnels of the St. Gotthard railroad, about 5,000' long—was, that explosive gelatine was from 1¼ to 1½ times as effective as dynamite No. 1.

The French engineer Moreau states that, according to his experience, by the use of explosive gelatine 20 per cent of labor was saved and 15 per cent in time was gained.

The general result of a three years' experience in the use of explosive gelatine on the St. Gotthard railroad was, that, under the circumstances, the use of dynamite is 13 per cent and use of black powder 18 per cent more expensive in driving advance headings of tunnels than that of explosive gelatine. Explosive gelatine is more difficult to explode than dynamite, requiring 3.5 times greater force, which makes the use of the former safer than that of the latter. To explode gelatine a primer of dynamite is used with triple-force caps. Both dynamite and gelatine freeze at a temperature of 43 degrees F.; but, while frozen dynamite is more difficult to explode, frozen gelatine is easier exploded, but still more difficult than dynamite not frozen.

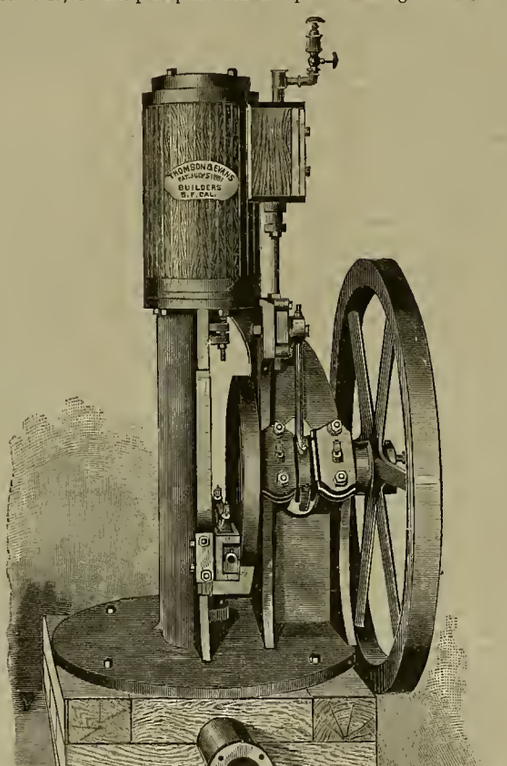
If slowly heated, dynamite explodes at 356 degrees F.; explosive gelatine only at 379 degrees F., or when very quickly heated at 414 degrees F. Explosive gelatine is entirely indifferent to moisture; even when submerged in water for several months it does not lose anything of its effectiveness. It changes its color, however, to a milky appearance, which it loses again when exposed to the atmosphere. As great a pressure as 14,000 lbs. per square inch was not sufficient to press any nitro-glycerine out of the gelatine, which proves that the two ingredients of gelatine—nitro-glycerine and gun-cotton—are chemically combined, and not only mechanically. This fact has been established by a commission appointed by the Austrian government.

By a large number of carefully executed experiments made in the presence of the committee of the Austrian Society of Architects and Engineers, it was demonstrated that explosive gelatine is 59.1 per cent stronger and more effective than dynamite No. 1, while its economical value is 49¼ cents to 31⅛ cents, the value of the latter.

This substance is now being made on this Coast by the Giant Powder Company, Bandmann, Nielsen & Co., agents, who are furnishing it to miners and others who have to deal with unusually hard rock.

Fluorspar.

Fluorspar is found in more or less quantity in almost every state and territory, but not very frequently in workable quantity. No statistics of production are accessible, and the estimates of dealers vary widely; but the amount annually mined is very considerable, possibly reaching, according to Williams, 8,000 net tons per annum. Fluorspar is used as a flux, and as a glaze in the pottery trade, and in the production of hydro-fluoric acid, for etching on glass. The greater part consumed in this country is from home sources, little now being imported. Its spot value ranges from $10 to $20 per ton.



CRANK AND FLY-WHEEL MINE AND WELL PUMP.

Indiana and Ohio are said to lead in point of production. New York, Delaware, New Hampshire, and Kentucky also, have fluorspar in noteworthy amount. Fluorspar occurs massive in wide metalliferous veins near Bear Creek, Jefferson County, and James Creek, Boulder County, Colorado. The green, white, pink and purple colors are common, and often all the colors occur in a single specimen. The mines at Bear Creek have produced some 600 tons of fluorspar, but the supply from that place is exhausted. On James Creek the veins of fluorspar are undeveloped, as there is no demand for it as a flux. Fluorspar occurs frequently in the ores of Montana, Wyoming, Colorado and New Mexico, but only in small quantities. It is used as a flux in local smelters, but is not much in demand. Fine cabinet specimens come from Crystal Park, some showing crystals ten inches across.

The Manufacturers' Association.

Several meetings of the "Manufacturers'" Association of the State of California" have been held since the preliminary one of October 29th, and arrangements are pretty nearly completed for commencing active work. Incorporation papers have been filed in which the objects of the Association are stated to be "The encouragement, fostering, promoting and improving the manufacturing interests of the state of California, and more especially those belonging to members of the Association; to acquire the property necessary to carry on the business, etc."

A meeting of the Association was held on Monday last, when the following gentlemen were present: Messrs. Harney, Hecht, Haraszthy, Garratt, Doble, Phelps, Kerr, Hallidie, Scott, Savage and Spaulding. Mr. Irving M. Scott was in the chair. The main business of the meeting was consideration of the by-laws. The committee reported a set of by-laws which were, after some amendments, adopted. Another meeting will be shortly held, and active steps will be taken to enlarge the membership.

Double-Acting Pump for Wells and Mines.

The engraving on this page illustrates the Thompson & Evans double acting pump, for artesian wells and mines. It is a double-acting force-pump and direct-acting engine, with yoke and sliding block attached to crank, and is automatic in its workings. This form of pump has been in use some time, and proven its practical utility by everyday work under varying conditions. These engines are at work at the Original Keystone mine, Silver King mine, Arizona, and the following places in this city: Phelan's building, Fair's building, Geary street railroad house, Golden Gate woolen mills, Bay View distillery, Electric Light works, Hammam baths, Baldwin gas works, Pioneer woolen mills, The Hertel, the Artesian and the Shipley water works, the California sugar refinery, etc. The machine is strongly made, durable and reliable. Thompson & Evans, 110 Beale street, in this city, are the makers. Persons inquiring about these pumps should state size of well, number of gallons of water required per hour, depth from which water is to be taken below the surface, and height it is to be raised above the surface.

The Commissioner of the General Land Office has decided that El Sobrante reservation in California was confined to the land lying between the five surrounding ranches, exclusive of their surplus. The decision dismisses the claims made by certain persons to the lands near Oakland, California. He also decides that the lands between the Moraga and San Ramon ranches became public land in 1866.

It is stated that under the new arrangement by which it withdraws from California business the Northern Pacific railroad is to receive from the other routes a bonus of 20 per cent on their net earnings upon San Francisco business, which is equal to over $500,000 per annum.

The dividends of the Horn Silver have been reduced to $200,000 per quarter. Heretofore the stockholders have been receiving $300,000, hence the decline in stock from $7 to $5.

CORRESPONDENCE.

English Investments in Pacific Coast Mines—No. 7.

[Prepared for the MINING AND SCIENTIFIC PRESS, by H. DEGROOT.]

Richmond Con. M. Co.—(Limited)—Locality and Early History of the Property.

The mines and reduction works of this company are situated near the town of Eureka, Eureka County, state of Nevada. Originally, the claims which constitute this property consisted of the Richmond and the Tip-Top, to which several others, through purchase, have since been added. Although ore was discovered in this district, and the Richmond claims were located as early as 1865, not much effective work was done there until 1869, the efforts previously made at smelting the ore having failed of success, by reason of the imperfections of the furnaces put up,and the inexperience of those engaged in the business. In 1871 a small circular furnace was erected here, and with it such an amount of bullion turned out as conclusively proved the great value of the mine. The same year Mr. Jos. M. English bought the property, and immediately afterwards disposed of it to the Richmond Consolidated Mining Company (Limited), of London, England, which had been organized with a view to buying it.

Plant and Other Improvements.

This English Company, having ample means, proceeded at once to open up the mine in a thorough and systematic manner, erecting the following year such additional buildings as were required, and two more furnaces, with a smelting capacity of 50 tons per day each. Other improvements would at this time have been made but for an adverse claim that was sprung on the company, involving the title to some of their ground. This controversy was finally settled by their buying the Tip-Top location, the ground in dispute, and which has since proved to be of large value. This trouble disposed of, the company, on the 24th day of May, 1872, commenced operations with their new furnaces, which, planned and constructed by an experienced metallurgist and smelter, did their work well. From that day to this the Richmond Company have pursued a career of almost unexampled prosperity, the large and profitable production of bullion, commenced over twelve years ago, having since been continued, without interruption, and up till the past two years, without suffering material abatement.

The plant of this company consists at the present time of four smelting furnaces of large capacity, powerful steam hoisting-works, and a large and well appointed refinery, whereat the gold, silver and lead are separated, the precious metals refined, and the lead converted into merchantable shape before being shipped to market. A railroad, two and a half miles in length, has been laid down for transporting the ore from the mine to the furnaces. A foundry and machine shops have been built, enabling the company to make all the castings and most of the machinery required in the prosecution of their business. The improvements made here are all large, substantial and first-class throughout, the furnaces being of the water-jacket style, and the refinery, foundry and machine shops equipped with implements and appliances of the most approved patterns.

The Richmond Ore

Consists of a tractable argentiferous galena, the most of which carries the fluxes necessary to its ready reduction by smelting. During all the more prosperous history of the mine this ore assayed, on an average, metallic values to the amount of $60 per ton. For the past two or three years it has been diminishing in value, and last year averaged only about $44 per ton. Formerly, it yielded from 20 to 30 per cent lead, from four and a half to five tons of ore making one ton of base bullion. At present, it yields hardly more than 12 per cent lead. The precious metals consist of about one-third gold, and two-thirds silver.

Product and Dividends.

The value of the bullion turned out by this mine to date—gold, silver and lead included—amounts to $15,000,000, of which about $4,000,000 have been disbursed to the shareholders in dividends. Sixty thousand tons of refined lead have been produced at the works of the company.

The capital stock of this company consists of $1,350,000, divided into 54,000 shares, of the par value of $25 each. These shares are now quoted on the London market at $30, making the current value of the property $1,620,000. The net earnings of the mine amount to more than three times the capital stock of the company and to more than five times as much as they originally paid for the property.

Exploratory Work.

The developments made on this property are very extensive, consisting of shafts, tunnels, drifts, uprises, winzes, etc., every manner of subterranean excavation practiced in deep mining being here met with, whether driven for working or prospecting purposes. Immense chambers have been stoped out, and miles of exploratory drifts run in various directions, a vast amount of dead work having been performed during the past few years. The mine has now been opened up to a depth of 1,050 feet, and although the best portions of the large ore bodies formerly developed have been exhausted and no new ones of much importance have since been struck, the directors of the company, in their report for the year ending Feb. 28, 1883, state that bunches of good ore had lately been discovered in various parts of their ground, and that they hoped soon to reach larger and more valuable ones, indications pointing strongly to such result.

A Good History, Despite Some Fault Finding.

The management of this mine has sometimes been adversely criticised, the conduct of the superintendent in the field having been made the subject of severe strictures in certain quarters; but these attacks have generally been inspired by mercenary motives, their object having been to depreciate the shares on the London market. The record made by those in charge on the ground, as well as by the home management, is their sufficient vindication.

In regard to this mine and its vendor, the *Daily Report*, of San Francisco, has this to say in a recent issue:

"Every thing considered, we suppose that to the Richmond Consolidated mine, at Eureka, Nevada, must be awarded the merit of having made the best record of any mine west of the Rocky Mountains. Some mines on the Comstock have, it is true, produced more bullion, and declared a larger amount of dividends, but this was the result of forced and spasmodic efforts, which soon exhausted the stock of ores and demoralized the market, enriching the few, while it impoverished the many who had confided in the resources of the mines and the honesty of their management.

Very different has it been with the Richmond Consolidated. Sold in London some twelve years ago at a moderate price, the mine, afterwards opened up with skill and thoroughness, equipped with a first-class plant, and managed wholly in the interest of the stockholders, has returned to them in dividends its original cost many times over. From the time they commenced being paid in 1872 to the present time there has been no intermission of dividends, these amounting in the aggregate to something like $3,000,000. The shares of this company command now a premium of thirty per cent, their property being to-day one of the most valuable in the whole country.

The credit of placing this mine on the London market is largely due to Joseph M. English, one of our leading mining proprietors, and formerly a resident of San Francisco. To this gentleman is due the further credit of having sold in London the Sweetland Creek Hydraulic estate, the first mining property on this Coast to return dividends to British investors. It, too, proved in every respect a prosperous enterprise. Two years ago Mr. English sold to Boston people the Napa Con. quicksilver mine, of which he was principal owner. The large net earnings which this property has since made it seems likely to keep for an indefinite period, immense bodies of high-grade ore having lately been developed in the mine. In all his mining ventures, whether as operator or owner, Mr. English seems to have been singularly fortunate, there being, it is said, no failures to be recorded against him."

The compliment here paid Mr. English is well deserved. The good judgment displayed by him in the selection of properties for the English market, and his honorable methods in dealing with foreign investors, are certainly to be commended; but the report is a little at fault in some of its figures. The net earnings of the Richmond mine, instead of $3,000,000, should have been set down at $4,000,000, as already stated; moreover, we are of the opinion that several other mines might be named that have made as good a showing as the Richmond; the Idaho, in California, and the Ontario, in Utah, for instance, not to mention several others that in some respects can point to an equally good record.

TROUT AS A MILLING PROPOSITION.—A curious incident took place at the Mexican mill day before yesterday, says the Carson *Appeal*, which may be set down as a fact, for it is vouched for by half a dozen mill hands. About 3 o'clock in the afternoon John Moran, one of the workmen, noticed something wrong in the batteries, and the machinery was stopped. It was discovered, much to the astonishment of Superintendent Williams, that mixed up with the Belcher ore was a conglomerate mass, which, on inspection, proved to be brook trout. An investigation showed that the screen leading into the mill race had been broken, and with the rise in the Carson River the trout had swarmed in, and on account of the force of the water found it difficult to get back, as in their endeavors to shoot the rapids they generally missed the hole and struck the wire. The supply pipe, which furnishes water for the batteries and pans, was of sufficient size to allow the passage of the fish, and they were shot into the batteries and reduced to pulp. Mr. Williams also found over a hundred trout in the mill race too large to go down the pipe. The trout are now very thick in the river, and there is fine fishing in the vicinity of Empire. A wire screen has been placed over the mouth of the pipe, and now the fish do not interfere with the batteries.

Investments in Mexican Mines.

The current of speculation has for several years past set violently towards Mexico; but unless the mysterious laws which seem to regulate finance be revised, the tide will ebb as strongly as it has flowed. The result, as it affects mining, will be a suspension of the most legitimate projects, as unreasonable as has been the crazy confidence with which money has been thrust upon the dishonest and ignorant promoters of the most extravagant delusions. It is not to be wondered at that Mexican mining schemes should receive support, appealing so forcibly as they do to the imagination of the purchaser, and affording, as they believe, such unlimited scope for the play of the imagination on the part of the seller. Mexico has produced $3,000,000,000 of silver, and still pours forth $30,000,000 annually. The inference that mere common sense might draw from the first figures would be, that, in the nature of things, there must be little left in store whence so much has been taken; but the second figures contradict this conclusion. Nevertheless, as preference is given to the one line of argument or the other, will capital be refused or granted for the more important and costly mining claims.

The enormous output of the past affords, undoubtedly, when coupled with the large output of the present, proof positive that the wealth which Mexico inclosed within her mountain ranges is by no means exhausted; but it does not necessarily prove that the old mines whence this wealth was extracted will pay if rehabilitated. Some perhaps will, some certainly will not. The history of the last days of some, if it reached the ears of the investor, would determine him to keep his money in his pocket. The facts ascertainable about the closing scene of others make it justifiable to risk heavily in reopening them; but the same romantic story is told in almost every case of rich ores which the imperfect Mexican method failed to beneficiate, but from which Yankee machinery will extract their full value; of revolutions which depopulated the region, and therefore closed the mines; of water which flooded them in the face of the puny appliances with which the Mexicans fought it; of rich workings closed because devils haunted them or priests cursed them, and so on and so on.

It is unquestionably true that mining was often checked, and some good mines closed, as one of the baneful results of revolutions; it is equally true that the horse-whim failed to cope with the water; and that in many cases good mines could not find capital to pay for steam-pumps. But it is not true that Mexican metallurgical methods are both costly and defective, and that all old mines were killed by external violence rather than by internal disease.

What is too generally true is, that an unscrupulous man, with ready wit and a glib tongue, goes south to Mexico, either denounces abandoned mines or buys an old languishing one for a trifle, concocts his romantic tale, and sells the history and the mine in the north for as many hundreds as he expended units. What follows is perhaps the necessary corrollary of the first act of folly. As the valuable mine was abandoned because its ores would not yield to Mexican treatment, therefore, American treatment must be applied, and a mill built; but as amalgamation failed in the Mexican *patio* process, therefore leaching must surely be the thing, and accordingly a roasting furnace and tubs are put up. Skill to conduct the operation is the last thing thought of. Already the cost has far exceeded the estimates, and economy must be practiced; and as usual, economy at this point means cheap management. A director of a Mexican company boasted how admirably they saved the salary of a metallurgist. They had employed a man at a figure high in their estimation. He was taken mortally ill on his way south, and arrived at the mine a doomed man; but during the few remaining days of life, the superintendent tortured him into imparting all he knew, and that so effectually that when death released his victim the inquisitor felt himself to be a fully equipped metallurgist, and competent to run the leaching-works. How the leaching-works succeeded need not be told. A clever fellow christened Parral, the Leadville of Mexico. The misnomer created a smelting plant big enough to reduce in one day all the lead ores Parral could produce in a twelve-month. But, whoever lost the money, the epigram writer probably did not. A still cleverer man discovered, by a *priori* reasoning, the existence of tin in Durango some centuries after it had been worked. He described a course through Cornwall, Queensland and Penang, and, projecting it across the American continent, the line struck Oregon. His subsequent application of the experimental method in Oregon showed no tin there. So he revised his chart, and the curve fell on the Conito tin field of Durango. Perhaps, after all, his first isostannic line was the correct one; for had he continued it across the continent, it might have led him to the tin fields of the Black Hills and Alabama. Such charlatanism is not confined to Mexico; yet it seems to be most seductive when practiced on minds already predisposed to believe the marvelous, as most people are when they invest in foreign mines.

The records of the great mines of Mexico are matters of history. The condition of some of those mines below water-level is only matter of tradition. To put into working order such mines as Sombrete and Fresnillo will admittedly cost hundreds of thousands of dollars. Those who decide to resuscitate these great enterprises do so with full knowledge of the facts and of the risk they run. They know the fate which befell so many similar enterprises in the hands of Englishmen, sometimes through palpable mismanagement, at others through the poverty of the mines; but they count in their favor the accessibility which railroads will give to their property, and the salutary effect of closer supervision on their superintendents, and they depend for dividends on the cheapness with which the railroad enables them to equip their mine and mill with efficient machinery. We admire the courage of these adventurers, and every one interested in mining wishes them the rich reward they deserve. But no sympathy is due to the sufferer who has eagerly swallowed the fly decorated by some promoter with ridiculously gaudy feathers. Correct and honest information is within the reach of every investor, if he is willing to pay for it. He only offers a premium to dishonesty by investing his money without inquiry. Of this he may be pretty sure, that, as the Mexican is a good miner and a good metallurgist, if he abandons a small, shallow mine, his doing so affords strong presumptive evidence of its worthlessness. The Mexican does not conduct his underground operations on the same system, and does not break down ore from large veins as cheaply and with as little damage to the mines as we do; but he can trace with unerring instinct the course of the rich ore, and he removes only what it will pay him to treat. There may be some profit in mining and milling his leavings; but the profit will generally be scanty. Another fallacy which enters the stock in trade of a Mexican promoter is, that we can always make profit out of ores which the Mexican, with his clumsy method of treatment, has to reject. In certain localities, this is true; but it is by no means always so. At points near the railroads, we can undoubtedly smelt lead and copper ores with coke more cheaply than he can in his little furnaces, so expensive in labor and fuel. But we must recollect that heretofore labor has been one third or one quarter cheaper than it will hereafter be in the vicinity of the railroads, and this will go far to reduce the advantages which cheap freights will give us. But it is questionable whether, in localities where fuel and water are scarce, ore-mill processes and machinery will reduce free silver ores more economically and with less loss than the *patio*. It is of course inapplicable to very base ores, and, in handling these, a leaching process may in some cases be preferable to amalgamation after a chloridizing roast, or to the usual Mexican method of fusion with lead ores and litharge. But it is unwise to start with the assumption that Mexican methods are crude and inefficient, and that we can of course make money where they, in their ignorance and unskillfulness, failed. It is also hardly necessary to contradict the ridiculous stories of the richness of the ores. There is everywhere very rich ore, confined to very small veins or bunches. The average of very large bodies is comparatively low.—J. D., JR., in *Engineering and Mining Journal*.

Miners' Lien.

There is no species of meanness so reprehensible as that of the man who will deliberately contract for labor which he can not or will not pay when properly performed. Mine managers may, on rare occasions, be drawn into such contracts by the well justified belief that the money will be forthcoming at the right time to settle the account; but this excuse can not be justly played by those whose habit it is to default in nearly every instance of the kind, upon some pretended defect in the work, or without any defense whatever. When the hard-worked miner is the sufferer, there is little chance of recovery, and the time is coming when, if the law does not show a better protection, some harsh but summary punishment will be meted out to the rascals who have been pursuing this despicable course in our midst.

We have long felt the need of more stringent laws in this state to meet just such cases as this. Apparently the laws relating to miners' liens are very defective in certain particulars. As they now stand, it is not difficult for shrewd operators to use the time and labor of a dozen or more men to test the vein; then if it does not prove profitable, to abandon it and leave the worthless property to the laborers for their wages. While it is true that the miner is very frequently to blame for making contracts with those whose record for such dealings is notorious, and it is also true of making contracts, still the miner is by far the most frequent sufferer.—*Silverton Democrat*.

SOUNDING SANDS.—About twenty miles south of Stillwater, in Churchill County, on the Sands Springs Flat, at the foot of the mountain, there is a heap of sand about a hundred feet high and nearly a mile across, which sings in the wind and is constantly changing. The Reno *Gazette* says it is thrown by the wind, which there has a circular motion, into a vast wall, with a hollow in the center half a mile across, which goes two-thirds of the way to the bottom. It is steep and hard to climb to the top, and on the inside is even more steep—so steep that no one has ever dared to go down, for fear that the loose sand would slide down and bury him up. There are similar dunes on the Sandwich Islands, on the Hebrides and on the Atlantic Coast. Prof. Bolton, of Trinity College, Hartford, Connecticut, is collecting data in regard to them.

MECHANICAL PROGRESS.

Priming of Steam Boilers.

Suppose a 10-inch cylinder with a 2 inch supply pipe—such ill proportions are to be found in use by some who complain of foaming—and the piston velocity to be at the moderate rate of 300 feet per minute. In such a case the area of the cylinder is just 25 times as great as the area of the steam pipe, and the steam in the pipe must move 25 times faster than it does in the cylinder, or equal to 7,500 feet per minute, which is a little more than 85 miles an hour. With this velocity a lessened density is caused immediately around the mouth of the pipe, and the steam pressure in remoter parts of the boiler forces water instead of steam into the vacuity, just as the atmosphere forces water into a suction injector. If the steam pipe were twice the area, steam would have only half the velocity, and so in proportion. It is not the amount of steam that is taken that causes priming; it is the velocity, whereby we disturb the equilibrium of pressure in the boiler; and boilers should have plenty of steam room, water space, water level, and width of spaces, to help equalize the pressure; and steam pipes should be proportioned and placed so as to disturb the equilibrium of pressure as little as possible. Taking steam from two or more different parts of the boiler often helps very much.

But dirty water; how does that act to cause priming? I found a satisfactory answer to this question in a very simple way; at least it satisfies me, although others may have a different light. After wondering for years why dirty water should foam any more than clean water, I happened to be in the village drug store when the old doctor himself was tending the soda fountain. One customer took plain soda water; it sparkled some as the gas escaped from it, but there was no foaming. The next man took plenty of syrup in his, and it was all foam. I asked the old doctor why the first glass did not foam like the second one. He said there was more gas, more effervescence in the first glass, but there was nothing but the weight of water to prevent its escape, while the syrup was of a glutinous or adhesive nature, and formed films and membranous cells, which hold the gas from escaping, the whole forming so light a substance that it rose up in what we call froth or foam. Here was the answer to my question. The impurities of the water are adhesive, and form films and cells which hold the steam and yet are carried upward by the steam, and the lightness of the foam makes it easily carried off with the steam even at a moderate velocity of escape.—*American Miller.*

The Progress of Invention.

Like many other human activities, the patenting of new inventions "breaks out in spots." An example of this is found in the recent rapid issue of patents and applications for patents in a very few lines of invention. The first class to be mentioned, which, indeed, is the one that would be guessed by every intelligent reader of the newspapers of the day, is mechanism for the practical use of electricity. A new principle, such as that of converting sound-waves to electrical-waves, on a wire, as exemplified in the telephone, brings after it numerous devices for its practical application. Every great invention is thus followed by a numerous train of subsidiary patents, usually dependent upon it, as all the varieties of the sewing machine, with their many "attachments," were dependent upon the device of a needle with the eye in the point. So the telephone, with its improved transmitters, receivers, switchboards, and devices for "shunting," occupies a large share of the attention of the patent examiners.

Another impulse has been given to inventive talent by one of the whims of fashionable life. Four years ago the number of recent patents on two-wheeled vehicles might have been counted on one's fingers. In October, 1880, two patents of this sort were taken out, followed by others, and now the examiner in that line of conveyances is kept busy looking into the merits of new styles of village carts, with their paraphernalia. For several years past only a small number of applications for fire-escapes have been received, but since the disastrous hotel fire in Wisconsin such applications have been coming in rapidly. It has been said, in a figurative way, that once in his life every man of a mechanical turn of mind invents an automatic car-coupler. The records of the Patent Office, and especially the collections of rejected models, give some color to the saying. In the class of Car Couplings and Driving Carts," 184 patents were granted for July, 1882. For the same month this year 198 were issued.—*Iron Age.*

BLAST FURNACES IN ENGLAND thirty years ago generally averaged from 35 to 40 feet in height. The original "Middlesbro'" furnaces of Bolekow & Vaughan were 42 feet high, with 15 feet boshes. In 1855, Messrs. Cochrane's "Ormesby" furnace was the largest in the district, being 55 feet high, with 16 feet bosh. The height of the furnaces and width of boshes was gradually increased, until 1866, when Messrs. Bolckow & Vaughan erected a furnace 95 feet 6 inches high, with only 16 feet bosh. This furnace, however, proved too high, having regard to the width of the boshes. Furnaces in England are now generally built to a height of from 60 to 75 feet. Two furnaces just erected at the Spring Vale Iron Works, near Wolverhampton, are 60 feet in height, with 21 feet boshes. Cowper stoves are being put up in connection with these furnaces. It is a remarkable fact, as showing the enterprise of the pioneer Cleveland iron masters, that of the 53 furnaces built prior to 1862, only one was in existence (and that out of blast) in 1875, the whole having been rebuilt on improved principles. There are now 909 blast furnaces in England, Scotland and Wales, which are owned by about 190 companies. The Cleveland district has 163 furnaces within its limits, Scotland 144, South Wales 142, North Wales 10, South Staffordshire 116, North Staffordshire 40, and Lancashire and Cumberland 106.

IMPROVEMENT IN THE MANUFACTURE OF STEEL RAILS. A highly important improvement in the manufacture of steel rails, which is likely to still further decrease the already low price of those articles, by dispensing with a considerable proportion of the laborers now employed in the process, is indicated in the following special from Joliet, Ill., to the Chicago *Tribune*, dated October 15th:

A successful process for rolling rails at the works of the Joliet Steel Company, without reheating the ingots in the bloom-mill furnaces, was put in operation to-day. Two hundred and fifty rails were run through, direct from the shears; that is, they were taken from the converter direct to the bloom rolls, and instead of being taken from there to the bloom furnaces, were put at once through the rolls and finished, without losing a rail or sending back a single bloom. It is said that the rails worked just as well and as easily as they do when reheated and taken from the bloom furnace. The process will be adopted, and will throw from thirty to forty heaters, chargers, buggy-men and helpers out of employment, but this will be only a handful compared with the number that will be laid off when the new initial-heat and soaking-pit process is adopted. This will do away with both rail-mill and bloom-mill furnaces, and the one hundred or more operatives that man them, also fifty or seventy-five others engaged in the two extra meltings and heatings now used.

HOW ANNEALING MAKES METALS, ET ., PLIANT.—The annealing of wire, glass and other substances renders them soft, more ductile and less brittle. A substance is annealed by simply heating it and allowing it to cool gradually. Recent experiments have resulted in the conclusion that the heating results in a kind of rupturing or cracking open; and in seeking an explanation of this, it is thought that in bringing the substance—take wire for illustration—suddenly to a white heat, the air held both physically and mechanically in the wire is expanded and exploded, tearing its way out and leaving fissures and cracks all over the surface. These fissures are plainly visible, and assume the torn and ragged appearance that might come from such explosions of the contained air. The wire, before stiff, is now soft and yielding, simply because it is cracked, and bends readily at every break on its surface. To illustrate this we have only to paint a sheet of paper with a gum-like dextrine, or even mucilage; when the paper is stiffened, draw it over a sharp edge and crack the gum, and the paper will bend freely in every direction. Here the cracks are visible, and it is easy to see that they allow the gum to bend. It may, from this, be seen that annealing is a rupturing or cracking of a substance, and that its softness and pliability result from the free play given by the cracks.

ALLEGED LACK OF TECHNICAL EDUCATION AMONG AMERICAN MACHINISTS.—The Philadelphia *Ledger* says that a person who recently advertised for machinists tested the proficiency of all who applied, and remarked, when summing up the qualifications of the men, that, though the Americans pleased him the most by their brightness, the foreign workmen were, without exception, better educated. The Americans had picked up their trades in the shops, but most of the foreigners, in addition to their shop practice, had attended technical schools. The latter could not only do good work with the tools, but they could lay it out, make sketches, and, if necessary, draw the designs to scale. The American shop-taught workmen, though quick to understand, inventive, and skilled in the use of tools, were markedly deficient in drawing and such knowledge of mechanics as is required by the designer and draughtsman. Perhaps there is some truth in the above, but so long as American machinists continue to maintain their supremacy for superior ingenuity, excellence of work, and greater rapidity in its execution, they can afford to spend less time on the minutiæ of the schools. In some cases, where ignorance is bliss 'tis folly to be wise.

THE MACHINERY BUSINESS.—The *American Machinist* says that reports from various sections of the country indicate that, while the machinery business is not so brisk as it was one year ago, there are comparatively few complaints about dullness. It adds the special information that the erection of new car, locomotive and repair shops for railroads is probably greater this year than ever before, and gives a list of such shops erected this year that will employ many thousands of machinists and other mechanics.

SCIENTIFIC PROGRESS.

Another Cheap Light.

M. Soulzee has made another attempt to produce a cheap and brilliant light by the combination of gas and electricity. The arrangement comprises an ordinary gas flame, fitted with a curved metallic rod passing through the flame, provided with means for preventing overheating under the action of the electric current, which is taken from a secondary battery. It is claimed, in a notice of the arrangement given in the *Journal d'Eclairage au Gaz*, that under these conditions the illuminating power is considerably augmented in proportion to the additional expense. The light is also said to be white, and much cooler in respect of radiation than a corresponding light from gas alone, the relative proportion of luminous and heat rays being completely changed. What is supposed to render this combination practicable is the fact that the platinum does not require a great intensity of current, and that "one or two small elements will suffice to supply an ordinary light and make it give four or five times more light at a cost three times less than gas." These are nearly the same data of cost and illuminating power as those to which the public have been accustomed by electricians. It is a novelty, however, to find gas introduced into the combination in this fashion. According as the intensity of the current is increased or diminished, the flame may be rendered luminous or hotter, as the case may be, so that the arrangement is "capable of furnishing all gradations, from the brilliant flame to the most calorific radiations." Here, it is evident, is a gas stove and a light-house in one, and only needing a reliable secondary battery to be capable of use for either purpose.—*Artisan.*

SATURN'S RINGS.—Prof. Kirkwood, in 1868, accounted for the great division in Saturn's rings by the commensurability of the period of a body revolving at that distance from Saturn with the periods of the six inner satellites. Dr. William Meyer, of Geneva, has since investigated every possible combination of the commensurabilities of the revolution periods of the satellites, and finds six other places where a perturbing influence is exercised. The divisions most strongly marked seem to be at places where the commensurabilities are the closest and all the satellites take part. A faint division should be found in the inner bright ring, according to Dr. Meyer. Prof. Holden has noted a distant point at which the shading-off begins in the position indicated by Meyer's theory—a fact which seemed to have escaped Meyer's notice.

Dr. Meyer also gives a new determination of the orbits of six of Saturn's satellites—Eneeladus, Tethys, Dione, Rhea, Titan, and Iapetus. From each of these he has determined the mass of Saturn. The original observations are to appear in the "Memoires de la Societe de Physique de Geneva" during the present year.

Encke's division in the outer ring of Saturn has been examined by M. Schiaparelli, who finds that the position and lack of symmetry are the same as previously noticed, but the line is broader and more diffused than in 1881. He thinks the phenomenon is variable, and accounts for it by supposing the middle of the ring to be thinner, and by the change of orbit of the particles composing it. He also examined carefully the region about the inner bright ring and the dark ring. At times O. Struve's division was seen very distinctly, and on other occasions very faintly. More observations are necessary to determine whether the phenomenon is variable.

A NEW FORM OF DRY-PILE.—A new form of dry-pile has been described in "Wiedemann's Annalen," by J. Elster and H. Geitel. In the previous forms of dry-pile, from the time of Zamboni downward, the disks of foil and paper have been placed in glass tubes, with the result that the film of moisture collecting on the inner surface of the tube has always exerted a more or less destructive influence. In the new dry-piles the disks are strung with a sewing needle upon a single strong silk thread, which insures better insulation. Messrs. Elster and Geitel have made the very interesting observation that piles of this type can be charged from a Holtz machine. An ordinary Zamboni pile of 11,000 pairs of disks of tin and copper foil, gave, after ten minutes' charging, sparks 1mm. long, and was able to illuminate a small Geissler tube for some time with a discharge continuous at first and afterward intermittent. Following up this analogy, dry piles were constructed on the plan of a Plante battery. Thin disks of lead foil, alternating with disks of silk paper painted with a mixture of soluble glass and peroxide of lead, were strung upon silk strings. A charged pile of 7,000 such plates gave for 10 minutes a spark 1mm. long, and after 24 hours still showed electrification.

THE WHITE OF BIRDS' EGGS.—Tarchanoff has discovered that the white of the eggs of those birds whose young are born unfeathered differs from ordinary albumen, its most striking peculiarity being that it remains transparent after coagulation by heat. He designates it as "tata-eiweiss." It differs from ordinary white of egg in many respects. When coagulated it is fluorescent. It has less polarizing power, and contains more water than the white of hens' eggs. It gives no precipitate when abundantly diluted with water. It is at first strongly alkaline, but loses that reaction as the yolk develops. It is rapidly digested. It can be redissolved in water after drying at 40° C. It can be changed into what appears to be identical with ordinary albumen, *a*, by the addition of a few drops of concentrated solutions of neutral salts of alkaline bases, or, *b*, of concentrated ascetic or lactic acid; *c*, under the influence of carbonic acid at a temperature near boiling; *d*, by incubation. Experiments left it uncertain whether the ordinary albumen first passes through the "tata" form. It seems probable that the "tata-eiweiss" is a sodic or potassic albuminate. Tarchanoff, in the course of his experiments, produced yolkless artificial eggs by making fistulæ of the oviduct in hens. They bear the operation well, but it causes atrophy of the glands of the oviduct, and apparently of the ovary also. The mature ova are discharged into the body cavity. Under favorable circumstances, if a ball of amber is introduced into the upper end of the duct, the white with fully developed chalazæ and the membranous shell are deposited, producing a normally formed egg, in which the yolk is replaced by the amber ball. A ligature prevented the descent of the egg, during the experiment, into that region of the oviduct which secretes the calcareous shell.—*Pflüger's Arch. Physiol.*, xxi. 374.

THE JAVA UPHEAVAL.—The recent subterranean upheaval in the vicinity of Java grows more and more appalling as the facts in relation to it become better known and the real magnitude of the disturbance more fully comprehended. The changes in the configuration of the dry land and surrounding ocean bottom are even more extensive than was at first supposed. The London *Nature*, which ranks high as authority on such matters, in its latest issue speaks of the occurrence as follows: "The details which have reached us during the past week of the terrible seismal manifestations at Java prove it to be one of the most disastrous on record; probably, moreover, it is the greatest phenomenon in physical geography which has occurred (at least in the historical period) during the same space of time. It has altered the entire physical geography of the region, and the condition of the ocean bed. The existing charts of the strait (Sunda), with their careful soundings, are useless for purposes of navigation, and when quiescence is restored a new series of soundings will be necessary. Doubtless the results of the outbreak will receive minute attention at the hands of the Dutch government, and when all the data are collected they will form valuable material for the study of the physical geographer."

ARTIFICIAL PRODUCTION OF MINERALS.—Bourgeoise has succeeded in producing wollastonite artificially, by the direct fusion of the proper proportions of lime and silicic acid at a bright-red heat, and allowing the fused mass to cool in the furnace very slowly. Distinct crystals and crystalline masses were obtained, which corresponded entirely in form, though not in optical properties, with the natural mineral. The same investigator also succeeded in producing an artificial meionite, by fusion at a bright-red heat, of lime, magnesia, alumina and silicic acid, in the proportions corresponding to the composition of the natural mineral. De Schulten has produced an artificial analcime, by heating to 350° Fahr., in a hermetically sealed copper vessel, for eighteen hours, a solution containing the proper proportions of sodium silicate and sodium aluminate to constitute the mineral, with the addition of some lime-water to aid the crystallization of the resulting analcime. The resulting crystals exhibited the well known trapezohedral form characteristic of this mineral—the dodecahedron and combination of these two simple forms. The chemical constitution and the optical behavior of the artificial compound corresponded perfectly with those of the natural mineral.

DURABLE MOLDS FOR CASTING.—Doctor Schlagel, of Hoyerwerdaa, Germany, manufactures molds for casting, from clay and brown coal. Pure clay is ground very fine and kept dry for use. The coal is ground to a degree which is variable according to the kind of casting warranted. The clay and the coal are well mixed together, and when the clay is of good quality a mixture of the two in equal proportions will do for most purposes. Chamotte meal may be added to make the mold harder, but is not absolutely necessary. The mixture is worked, after the addition of water, into a stiff mass, which is used for the molds, the latter being made in a manner similar to sand molds, and dried slowly. When dry they are washed with a dilute solution of soluble glass and dried again, this operation being repeated three or four times. When perfectly dry, the mold is burned, to give it a glossy appearance.

IN HARDENING small steel tools, or any article of steel that is thin or light and heats quickly, it is advisable to remove, on a grindstone or emery wheel, the scale formed in forging before heating. The scale being of unequal density, if it is not removed it is generally impossible to heat evenly; besides, the degree of heat can be better observed if it is removed.

A GOOD READER.—A fair intellectual development, with good lungs and a good voice, will be a sufficient basis for one who desires to become skillful as a reader. Careful practice, daily, should be the rule, in accordance with the requirements of a teacher or a text-book.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Andes S M Co	Nevada	23	25	Nov	10	Dec	20 Jan 9	B Burris	309 Montgomery st
Bodic Tunnel Co	California	3	15	Nov	1	Dec	7 Dec 27	C C Harvey	309 California st
Benton Con M Co	Nevada	11	10	Nov	1	Dec	6 Dec 24	W H Watson	302 Montgomery st
Buena Vista Petroleum Co	California	31	25	Oct	30	Dec	5 Dec 27	L Kennann	220 Sansome st
Caledonia M Co	Dakota	14	10	Oct	31	Dec	13 Jan 11	W L Oliver	328 Montgomery st
Columbus Con M Co	Nevada	1	25	Nov	5	Dec	10 Jan 3	J M Buffington	309 California st
California M Co	Nevada	9	20	Oct	1	Nov	7 Dec 5	C P Gordon	309 California st
Champion M Co	California	13	10	Oct	8	Nov	15 Dec 8	Theo Wetzel	522 Montgomery st
Campo Seco Copper Co	California	2	10	Aug	10	Oct	1 Nov 20	D Buck	309 Montgomery st
Elko Con M Co	Nevada	2	15	Oct	6	Nov	12 Dec 4	F Sperling	309 California st
Eureka Con M Co	Nevada	7	10	Sept	27	Nov	10 Nov 30	A F Main	418 Jackson st
Eureka Tunnel Co	Nevada	2	50	Nov	9	Dec	10 Jan 11	J Pardy	Eureka, Nevada
Gould and Curry S M Co	Nevada	46	50	Nov	7	Dec	16 Jan 3	A K Durbrow	309 Montgomery st
Gold Land M Co	Nevada	4	5	Nov	9	Dec	17 Jan 8	J Bronzan	328 Montgomery st
Henrietta Gravel M Co	California	7	02	Oct	23	Nov	23 Dec 14	L Gross	530 Washington st
Mayflower M Co	California	20	15	Oct	4	Nov	6 Nov 22	J Moriaio	328 Montgomery st
Martin White M Co	Nevada	16	25	Sept	22	Nov	7 Dec 6	J J Scoville	309 Montgomery st
McElroy Gravel M Co	California	11	25	Oct	25	Nov	30 Dec 26	J T Fogarty	806 Montgomery st
Savage M Co	Nevada	27	50	Nov	3	Dec	7 Dec 27	E B Holmes	309 Montgomery st
Union Con M Co	Nevada	24	50	Oct	15	Nov	20 Dec 11	J M Buffington	309 California st
Utah S M Co	Nevada	46	1.00	Oct	11	Nov	16 Dec 3	C Pratt	309 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Ithaca Con M Co		W Grainger	305 Sansome st	Annual	Nov 27
Kentuck M C	Nevada	J W Pew	310 Pine st	Annual	Nov 28
Little Chief M Co		S C Dean	22 California st	Annual	Nov 22
North Gould & Curry M Co	Nevada	C H Mason	331 Montgomery st	Annual	Nov 20
Summit M Co	Nevada	G W Sessions	309 Montgomery st	Annual	Nov 19

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Bulwer Con M Co	California	W Willis	309 Montgomery st	15	July 2
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	Nov 19
Mt Diablo M Co	Nevada	C H Heath	318 Pine st	25	Nov 26
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	Nov 1
Silver King M Co	Arizona	J Nash	315 California st	25	July 12

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Oct. 24.		WEEK ENDING Oct. 31.		WEEK ENDING Nov. 7.		WEEK ENDING Nov. 14.	
Alpha	2.10	2.15	1.90	2.00	1.75	1.90	1.15	1.60
Alta	1.25	1.55	1.30	1.60	1.30	1.65	1.00	1.45
Andes	...	.55	.65	.70	.65	.70	.35	.65
Albion	...	...	...	.40	...	.40	...	.40
Argenta	.15	.20	.15	.20	...	...	...	...
Atlas	...	...	...	...	...	...	...	...
Belcher	1.10	1.25	1.00	1.15	...	...	.85	.90
Belding	...	...	...	...	...	...	...	...
Best & Belcher	3.65	4.00	3.60	3.90	3.60	3.85	3.00	3.60
Bullion	...	.90	...	.85	.65	.66	.50	.65
Bechtel	...	...	...	...	...	...	...	...
Belle Isle	.40	.50	.40	.45	...	.45	.40	.45
Bodie Con	.50	.65	.25	.40	.30	.40	.25	.35
Benton	.15	.20	.15	.20	...	.15	.10	.15
Bodie Tunnel	...	...	...	.10	...	.05	...	...
Caledonia	...	.15	...	.15	...	...	.10	.15
California	.10	.20	...	.10	.25	.50	.25	.30
Challenge	...	.35	...	.35	...	...	...	.35
Chollar	2.25	2.70	2.25	2.40	2.05	2.35	1.65	2.15
Confidence	1.60	1.75	...	...	1.50	1.70	1.30	1.50
Con. Imperial	...	...	...	...	...	.05	...	.05
Con. Virginia	.45	.60	.45	.55	.45	.50	.35	.45
Crown Point	1.20	1.30	...	1.20	1.05	1.10	.80	1.05
Day	...	...	...	...	...	...	...	.40
Elko Con	...	...	...	...	...	...	.20	.40
Eureka Con	4.25	5.00	4.15	2.25	4.00	5.00	...	3.85
Eureka Tunnel	...	.10	.05	.10	.05	.10	...	.05
Exchequer	.40	.55	.30	.50	.40	.45	.35	.45
Grand Prize	.50	.55	.45	.65	.45	.60	.30	.40
Gould & Curry	1.75	2.35	1.80	2.00	1.70	1.90	1.20	1.65
Hale & Norcross	2.30	2.80	2.00	2.40	1.70	2.25	1.35	1.80
Holmes	...	...	...	...	...	.20	...	...
Independence	.40	.45	...	...	.35	.40	...	...
Julia	...	...	...	...	...	.05	...	...
Justice	.25	.40	.25	.35	.25	.30	.15	.30
Jackson	...	...	...	...	...	.50	...	...
Kentuck	...	...	...	...	...	2.00	...	2.50
Martin White	...	...	...	.25	...	...	...	.25
Mono	...	...	...	...	...	...	...	...
Mexican	3.20	3.50	3.05	3.35	3.00	3.30	2.25	2.95
Mt. Diablo	...	4.00	...	4.00	...	4.00	...	...
Mt. Potosi	...	...	...	...	...	...	...	...
Noonday	...	...	...	...	...	...	...	...
Northern Belle	4.00	4.25	...	4.25	4.00	4.25	...	4.00
North Noonday	...	...	...	...	...	...	...	...
Navajo	4.10	4.80	3.35	3.65	3.05	3.95	3.70	3.85
North Belle Isle	.60	.65	.55	.60	.50	.55	...	.55
Occidental	1.10	1.50	1.00	1.40	...	1.40	...	1.00
Ophir	5.50	5⅞	5.75	5⅝	4.80	5⅝	3.70	4.05
Overman	.35	.40	...	.30	.25	.30	...	.20
Oro	...	...	...	...	...	...	...	...
Potosi	.90	1.05	.85	.95	.75	.90	.55	.75
Pinal Con	...	...	...	...	...	...	...	...
Savage	1.00	1.25	.85	.95	.60	.90	.50	.80
Sag. Belcher	...	...	...	...	...	...	...	...
Sierra Nevada	3.65	4.25	3.65	4.00	3.8	4.15	3.20	3.90
Silver Hill	...	.10	...	.05	...	...	...	...
Silver King	...	7.50	...	8.00	...	...	...	7.75
Scorpion	.50	.60	...	.50	...	.50	.45	.50
Tuscarora	...	...	...	...	...	...	...	...
Union Con	3.50	3.90	3.55	3.70	3.55	3.80	2.60	3.75
Utah	1.60	1.90	1.70	1.80	1.40	1.70	1.30	2.25
Ward	...	...	...	...	...	...	...	...
Wales	...	...	...	...	...	...	...	...
Yellow Jacket	3.15	3.40	3.30	3.50	3.05	3.35	2.50	3.30
	...	...	...	...	...	...	...	...

Sales at San Francisco Stock Exchange.

THURSDAY A. M., Nov. 15.

640	Alta	1@1.05	
200	Andes	40c	
60	B. & Belcher	3.15@3.20	
100	Bodie Con	35c	
100	Benton Con	10c	
50	Belle Isle	40c	
50	Belcher	20c	
100	Bodie Tun	05c	
230	Chollar	12@1.80	
125	Con. Virginia	45c	
300	Con. Imperial	05c	
200	Crown Point	80c	
100	Exchequer	30c	
75	Gould & Curry	1.40	
570	Hale & Nor	1.40@1.45	
200	Justice	20c	
320	Mexican	2.35	
50	N. Belle Is	55c	
250	Overman	20c	
400	Potosi	55c	
600	Savage	50@55c	
150	Sierra Nevada	3.25	
40	Utah	2.25	
80	Union Con	3.30	
270	Yellow Jacket	2.65	

AFTERNOON SESSION.

100	Alpha	1.15	
1500	Alta	1	
100	Albion	40c	
700	Benton	05c	
400	Bodie	35c	
650	Best & B	3@3.05	
200	Belle Isle	40c	
705	Chollar	1.65@1.70	
250	Con. Virginia	40c	
100	Crown Point	90c	
400	California	25c	
100	Eureka Con	3.85	
510	Gould & Curry	1.40@1.30	
1970	Hale & Nor	1.35@1.40	
650	Mexican	2.10@2.30	
200	M. White	25c	
110	Navajo	3.75	
170	Northern Belle	4	
200	N. Belle Is	50c	
105	Ophir	3⅞	
50	Occidental	1	
800	Potosic	55@60c	
400	Savage	50@55c	
870	Sierra Nevada	3.30@3.35	
1095	Union	2.80@2.85	
60	Utah	2.20	
260	Yellow Jacket	2⅛	

GERALD PEMBERTON, who shipped as a hoy on the steam whaler *Bowhead*, on his arrival here this week from the Arctic, found that during his absence a fortune of £10,000 had been left him. On getting ashore he immediately asked for a discharge.

MINING districts in the western portion of Utah, long since abandoned, are being prospected successfully by miners.

ONE of the small mines of Tintic, Utah, has taken out $100,000 worth of high grade ore this season.

Mining Share Market.

The inactivity in the stock market continues. There is very little of interest to record, transactions being comparatively few and fluctuations small. Up on the Comstock they are still sinking away, but nothing startling has occurred there for some time. At the Ophir a considerable amount of ore in the shape of filling is being extracted from the 150 level. It is evident, from the explorations that have already been made, that not much new ore need be expected at this point. The ground has been pretty thoroughly worked over, and they must look deeper. At the Hale and Norcross they are still doing some prospecting, but the strong indications of water in various directions greatly circumscribes the operations. They will not be able to strike out squarely across the vein until the new hydraulic pump is in operation at the Chollar-Norcross-Savage shaft. Then they need have no fear of water drowning them out, and may go in whatever direction promises best. Then they may also fearlessly crosscut in the Chollar, the Savage and the Potosi. At Gold Hill the amount of ore extracted at the several mines—Crown Point, Belcher and Yellow Jacket—is being steadily increased. At the latter they are now daily extracting about 100 tons of ore, and have a large amount in sight, into which they have opened out on the Sagebrush level.

Bullion Shipments.

Ontario, November 6, $10,611; Horn Silver, 6th, $12,000; Hanauer, 6th, $2,560; Crescent, 7th, $2,490; Stormont, 6th, $2,490; Vienna, 7th, $1,827; Horn Silver, 7th, $15,000; Alice, (for Oct.) $105,836; Vienna, 8th, $3,372; Ontario, 3d, $9,775; Bullionville, 8th, $6,934; Horn Silver, 8th, $6,000; Hanauer, 9th, $7,200; Alice, 9th, $11,362; Vienna, 9th, $3,442; Ontario, 9th, $4,664; Horn Silver, 9th, $12,000; Alice, 10th, $14,809: Horn Silver, 11th, $9,000; Ontario, 11th, $4,592. Bullion and ore receipts in Salt Lake City for the week ending November 7th, inclusive, $176,468.69, of which $171,958.69 was bullion, and $4,510 ore.

News in Brief.

SEVERAL of the carriages which recently took the guests to the Guildhall banquet carried electric lights in place of the ordinary lamps.

A SEVERE gale swept over the lake region, New York and New Englaud, on Sunday, causing the loss of several lives and much property.

SEVERAL of the London newspapers recently published articles suggesting the establishment at New York of homes for the reception of English girls who emigrate with the intention of becoming domestic servants.

ONE Neehle having made a splendid pedestrian record without stimulants, a New York admirer offers to hack him against any other pedestrian in the world on an attempt to walk 250 miles in 100 hours, and to make two and one-quarter miles in each and every hour.

AH YOU, a Chinaman twenty five years old, applied to a United States Commissioner in New York, on Saturday, for first papers as a citizen of this country. The United States District Attorney decided that under the act of Congress he could not become a naturalized citizen of this country.

THE Mexican government definitely refuses the demands of the English hondholders to issue $20,000,000 three per cent honds in addition to the recognized debt, $80,000,000. The decision ends the negotiations, and the Mexican representative in London has been recalled. The Mexicau government desires a settlement, but considers the bondholders' demands excessive.

STRENGTH and health go together. Obtain this happy physical state by using a bottle of Brown's Iron Bitters.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

SUTTER CREEK.—Cor. *Ledger*, Nov. 10: The Amador mill is running 20 stamps steadily. The company have got in heavy supplies of wood and timbers, which looks like business through the winter. It is expected that even if the rock now being crushed should be of low-grade it will improve as the tunnel advances towards the old works.

DOYLE.—W. Doyle, on Saturday, sold his quartz claim in Hunt's Gulch, to Daniel H. Sawyer, for $15,000. Recent developments on this claim are of a very encouraging character. A large body of ore, apparently of good quality, has been met with in the tunnel. It is plentifully charged with sulphurets, and prospects well in free gold.

NOTES.—In the Wabash claim, where a streak of rich ore was struck, the ledge has increased from 20 inches to 4 ft in width. The work now in hand is sinking a shaft from the tunnel. A. Hayward has secured a controlling interest in the Seaton mine. Humphrey Rees is superintendent. Ten or twelve men are employed about the mine. At present drifting for the ledge is the work in hand.

Calaveras.

NOT YET PLAYED OUT.—*Chronicle*, Nov. 10: Notwithstanding the placer diggings are considered "played out," a clean sweep has not yet been made. J. Hines & Co. recently struck a pretty fair little bonanza in Alabama Gulch where it debouches in the Calaveras River, below Rich Gulch. They have been at work for sometime opening the claim. The other day they succeeded in extending their work into the diggings, and, scraping the bedrock and panning the dirt, in about an hour's time they had gathered nuggets to the value of $120; the largest, which was shown us, being about the size and shape of an almond nut.

El Dorado.

GREENWOOD.—Cor. Placerville *Democrat*, Nov. 10: E. W. Hulford is at work on the Cederberg, Dr. Martin has resumed operations on the New El Dorado, the tunnel on the Morrell Con. is being quietly pushed along, and the Smith Bros. are having some work done on their American Canyon claim. At Zentgraf's, (near Wildgoose Flat) all is activity. Mr. Zentgraf has run a tunnel from the mill 309 ft along the ledge, giving him an ample supply of ore for milling during the winter, and at the mine he has built a water-power wheel to drive a 6-inch pump. The ore from this mine is of superior grade, and Mr. Zentgraf has every prospect of a profitable winter's work on his 2 mines.

NEW EL DORADO GOLD M. CO.—Georgetown *Gazette*, Nov. 9: This week Mr. A. W. Martin favored us with a prospectus of the new company. Mr. Martin has just returned from San Francisco, and will begin the work of development right away with a good force. On the south is the famous old Cederberg which has yielded close on half a million of dollars, which after a long period of idleness is now being opened up by Mr. Ed. Hulford. On the north is the Morrell Con. mine. This company is now driving a tunnel to cut the rich shoot seam 60 ft below the present level. It is well known that handsome specimens of quartz more than half gold and weighing from a few ounces to many pounds have been found from time to time on the hillside of this claim. Few mining enterprises have so good a promise for a rich reward as the New El Dorado. A new life is growing up all along the line of the great Greenwood seam belt. We feel confident of grand results flowing from the enterprises inaugurated there this winter. A shaft has been sunk in the ledge to a depth of 40 ft, from which $15,000 or $20,000 worth of rich ore was taken. One piece of quartz, some 18 inches square, taken from this shaft, sold for $6,400. A portion of this specimen is now on exhibition in the Academy of Sciences in Paris, France.

Fresno.

GERTRUDE ITEMS.—*Republican*, Nov. 10: The Enterprise mill is running again, and will doubtless make a very successful run, as there is a large quantity of ore on the dump and plenty of water. The Hamilton mine has been sold and the new proprietors are erecting a mill, and making extensive preparations to run the mine on a large scale in the future. A hundred tons of ore from this mine are being crushed at the McDonald mill. A car-load of ore is being "packed" down from Mount Raymond to Fish Camp for shipment.

Inyo.

BROWN MONSTER.—*Independent*, Nov. 3: Car-loads of ore are being shipped, and with returns that indicate the ores to be of high grade. The last car-load of 10 tons shipped to Oakland sold for $95 per ton. There is at the railroad another load of equally valuable ore ready for shipment or reduction. The adjoining mine, the Hirsch, is also being worked, and high-grade copper and galena extracted.

AT ELNA.—From advices we learn that the furnace is done, and that as soon as W. P. Miller arrives, who is expected every day, arrangements will be made for commencing operations and firing up for steady work. The new tunnel on the Montezuma is progressing rapidly, and is being driven in ground that shows a good quantity of carbonate ore of fine grade.

Kern.

PIRU MINING DISTRICT.—Cor. of Bakersfield *Californian*, Nov. 10: We have just struck the ledge we were running for. It shows quite a large body of first-class gold and silver bearing ore. We are down 70 ft. This is only one of the mines which comprise the new Comstock lode. There are ten claims in all, aggregating 15,000 linear feet. It would be a fine property for some strong company, as all these claims show ore on the surface, worth, under a working test, from $29 to $35 per ton in gold and silver. There is plenty of water and timber in the vicinity. The Frazier mine has a few men employed. It is understood that the owner is now in England negotiating the sale of the property. Rich ore has been found in every part of the district during the recent prospecting season. Quite a boom here is inevitable next year. We have ores precisely the same character as those of the celebrated Calico district. We are but 100 miles distant from it, and in the same mountain system.

Mariposa.

BUENA VISTA MINE.—*Herald*, Nov. 9: The O'Gorman brothers have made all arrangements for the erection of a ten-stamp mill on the Buena Vista, and the work will be commenced at once. Teams have been engaged to haul the machinery from Bear Valley. James O'Gorman thinks the mill will be ready for work within a month. Only 5 stamps will be placed in position for a short time.

Mono.

STANDARD-BULWER MILL.—Bodie *Free Press*, Nov. 7: The Standard-Bulwer mill, under the management of Sam McCurdy, is considered by millmen to be the very best on the Coast. The 30 stamps crush daily from 145 to 155 tons of Standard ore, which is handled so systematically that the visitor wonders how it can be done. From one floor to another material is conveyed by various appliances, most of which originated in the brain of Mr. McCurdy. An hour or two may be profitably spent in examining this model quartz-mill. It is safe to say that no other mining camp can boast of one like it.

NUMBER 78.—The Standard Con. Mining Co. has declared its 78th consecutive monthly dividend of 25 cents per share, or $25,000, payable in San Francisco and New York on Monday, the 12th inst. This makes the aggregate of dividends paid by the Standard Company $4,300,000.

MAY LUNDY.—Homer *Index*, Nov. 10: The south drift from No. 1 winze, 130 level below the lower tunnel, was advanced 10 ft during the week, and shows improvement in size of vein and quality of ore. All the stopes are looking well, and while the mill is crushing 30 tons per day, the teams are rapidly filling up the large ore yard. Seventy-five men are to be employed underground in the May Lundy alone during the winter, opening up new levels and running out ore, and a 40-stamp mill is to be erected at or near the foot of the tramway as early next spring as practicable

Nevada.

MERRIFIELD.—*Transcript*, Nov. 8: The Merrifield mine, which has been idle for 10 weeks past, has been purchased by a New York incorporation known as the "Merrifield M. Co. of New York," the transfer having been accomplished through the agency of D. T. Hughes. Mr. Hughes takes charge of the Merrifield, and will to-day start steam. He will begin with a moderate force of men, increasing the number as circumstances will admit. All the floating indebtedness will be paid in full on Saturday next.

IDAHO.—Grass Valley *Union*, Nov. 6: The Idaho M. Co. yesterday declared a monthly dividend of $2 per share, amounting to $6,200. The payment of a $2 monthly dividend is an increase of $1 per share over the dividends that have been paid for several months past. The company has been under extraordinary expenses the present season, but the prospects for regular dividends seems now assured. The mine is looking well on the 12th, 13th and 14th levels, and a strong ledge is in the shaft.

Placer.

DAMASCUS.—The Placerville *Democrat*, of Nov. 10, says: Messrs. E. Mortensen and Frederick Shermier, who are mentioned in the Placer *Herald* as having just made a remarkable strike in gravel at their claim above Damascus, in Placer County, own 640 acres, and have been working the claim for 7 years. When there last week they found that gravel had been cut into for 30 ft in width, and in prospecting no pan of dirt was washed containing less than 25 cents, and many went as high as $5 and $6. The indications are that they have several hundred ft of gravel.

Plumas.

RIVERDALE.—Quincy *National*, Nov. 10: The shaft is going down slowly, 1 side being in bedrock, which is pitching to the west, indicating that they are on the east rim of the channel. They will have to sink some feet further to bottom it. There is now no question but that the Riverdale ground is rich. It is also highly probable that the famous lead runs through the O'Neill ranch.

RICH PAY.—Loring & Leavitt have made another lucky strike in Elizabethtown, and the indications are that they have several hundred feet of the channel which have never been worked. We have no figures, but are told they are making big pay.

MILLS SHAFT.—The big tube is going slowly down into the bedrock at the bottom of the valley, being now nearing 230 ft deep. The rock is soft and the drills cut it easily. Some more tubing is on the road, which would indicate that it is to be pushed down some 20 ft into the bedrock before drifting will commence.

SOUTHERN EUREKA.—Greenville *Bulletin*, Nov. 7: The tunnel reached the ledge a week or two ago, and since then a drift has been pushed into the chimney about 40 ft, and at a depth of about 168 ft below where Taylor took out the last rock. The ore found in this drift is better than the best worked by Taylor. This is in accordance with what was seen in the upper workings, that the ore is richer the deeper it goes. The mill will be put in order and started up again without delay.

San Bernardino.

DAGGETT.—*Semi-Tropic*, Nov. 10: Jack Cockrane last week struck a splendid body of ore in his mine. One shot knocked loose 2 tons of ore which would assay fully $500 per ton. The King is doing splendidly; 16 and 18 mule teams are constantly on the road from Calico to Daggett, hauling ore. Calico mines generally are full of promise. Mr. Bateman, at the Lava Beds, recently made an immensely rich strike, the ore from which assays up in the thousands. The Lava-Bed mines are looking excellently.

Sierra.

RAINBOW.—Downieville *Messenger*, Nov. 10: The Rainbow M. Co., at Chips' Flat, is still employing Chinese in running their bedrock tunnel. It is reported that the celestials have been armed with rifles, with the expectation that the white men of Alleghany would attempt to drive them off. We have not heard that any resort to force was contemplated. Should, however, the Miners' Union at Forest City and Alleghany decide to remove the obnoxious workmen, a few rifles in the hands of the Chinese would not prevent their accomplishing that object.

GRIZZLY.—*Tribune*, Nov. 8: The old Grizzly ledge, which is located near the noted Alaska mine at Pike

City, is being reopened by direction of the present owner, formerly a resident of this county. The gentleman discovered the rich central pay shoot in the Alaska, which yielded such handsome dividends to the owners a number of years ago. The Grizzly was located in 1854 by some miners, who found rich gold quartz in the croppings, from which several thousand dollars were crushed out in a hand mortar in a few hours. At times since the ledge has yielded rich specimen quartz, but the bulk of the vein is a milling ore of excellent grade, carrying fine free gold and sulphurets rich in metal. Astonishing "pan-prospects" can be obtained anywhere along the walls in the upper tunnel, where some 500 tons of ore are already uncovered, awaiting extraction.

RENEWING AN OLD PROSPECT.—L. D. Davis was up at Lady's Canyon last week, surveying a quartz claim that he and George Davis are interested in. The claim lies north of the Columbo location. The ledge is of more than average width, prospects well in the croppings, and bears every indication of proving a true fissure vein.

BONANZA.—Mr. Sunderland, superintendent of the Bonanza mine, at Howland Flat, was in town last week. A small force of men are engaged in carrying on developments in that claim. It is believed that the company will succeed in uncovering a rich channel in their ground.

BALD MOUNTAIN.—From 300 car-loads of gravel taken out of the South Fork ground the Bald Mountain Extention Co. cleaned up 47 ounces of gold Sunday.

Trinity.

MINING NOTES.—*Journal*, Nov. 10: Supt. Loveridge is getting the Oregon Gulch mine in splendid shape for work the coming winter, and calculates upon taking out a large quantity of "the precious," if the water supply shall be good. John W. Shuford has our thanks for a number of specimens from the Little Donkey mine, in Trinity Center district. While free gold is visible in some of the pieces, all prospect well.

Tuolumne.

LAMPHIER.—Sonora *Democrat*, Nov. 10: Sinking in the shaft at the Lamphier mine has been recommenced. The shaft has been enlarged, and 3 shifts, of 4 men each, are putting it down with all dispatch. The ledge in the bottom is very large, and the quartz is very rich. The work of extracting rock has been stopped until the mill is ready to start. Five more stamps have been ordered, which brings the number up to nine. Four Frue concentrators are being put up.

RISING SUN.—Matters are progressing satisfactorily at the Rising Sun. The mine is developing beyond the most sanguine expectations. The mill is rapidly nearing completion. A ditch 4 miles long is being dug to bring water.

PATTERSON.—Developments in the lower levels of the Patterson mine continue to be of the most encouraging character. The quality of the ore has improved in a marked degree, and some of it fairly bristles with free gold.

GARIBALDI.—The Garibaldi mill is about completed. The machinery is being put in place and will be ready to start up in a few days. This is an experimental mill Huntington's centrifugal. The present condition of the weather and a scarcity of water makes it favorable for "dry washing."

NEVADA.

Washoe District.

HALE AND NORCROSS.—*Enterprise*, Nov. 10: Some ore of good quality was found in the east cross-cut from the main north drift on the 2700 level, and in the east cross-cut from the south drift the indications are favorable for finding the same streak. At some points it was found necessary to discontinue work until the new hydraulic pump at the Chollar-Norcross-Savage shaft goes into operation, as there were strong indications of water.

ALTA.—Are now engaged in placing a partition in the shaft for the purpose of creating a circulation of air that will cool and ventilate the 2150 level.

UNION CON.—On the 3000 level work has been resumed in the west cross-cut, which is being advanced in a soft and promising vein material. On the 3100 level a station is being cut out joint with the Sierra Nevada.

SIERRA NEVADA.—The upraise from the main north drift on the 2900 level is being advanced at the rate of 15 ft per week. It will be pushed up to the 2700 level as rapidly as possible.

MEXICAN.—Good progress is being made in the main north drift on the 3100 level, which is now nearing the south line of the Union Con. The ground continues dry and favorable to progress.

YELLOW JACKET.—About 100 tons of ore per day is now being extracted, and the amount is gradually increased.

CROWN POINT.—The amount of ore extracted is gradually being increased. The mills on the river will soon be running to their full capacity.

COMBINATION SHAFT.—The station for the new hydraulic pump is completed and the foundation finished, ready for the reception of the machinery, which will soon arrive from San Francisco.

CALIFORNIA.—On the 2700 level the joint Con. Virginia winze is being sunk and timbered at the rate of 10 to 12 ft per week, in ground of a favorable character.

BELCHER.—Some ore is being extracted, and the amount will be gradually increased as additional stamps are put in operation in the mills on the Carson river.

CON. VIRGINIA.—The joint California winze on the 2700 level is being sunk and timbered at the rate of 10 ft per week.

UTAH.—On the 1350 level east cross-cut No. 2 is being pushed ahead at the rate of about 30 ft per week.

BEST AND BELCHER.—Very good progress is making in the joint Gould and Curry winze on the 2500 level. Thus far the ground is dry and favorable.

GOULD AND CURRY.—Work in the joint Best and Belcher winze, on the 2500 level, is progressing favorably. It will be sunk to the 2700 level.

ANDES.—Considerable ore is being extracted and sent to the mills, and the drifts are still finding ore that will pay for working.

OPHIR.—A considerable amount of ore in the shape of old fillings-in have been extracted from the 150 level.

OVERMAN.—Some low-grade ore is still being extracted from the old upper levels.

IMPERIAL.—Rapid progress is being made in the west drift from the 600 station.

UNION SHAFT.—Are still cutting out behind and easing timbers at the 2300 station.

Bernice District.

WILD GOOSE.—*Silver State*, Nov. 8: The Austin *Reveille* learns from a gentleman just in from Bernice, that the Wild Goose mine has just had 13 tons of ore crushed at Rothwell's mill. The first grade went over $200 a ton, the second $107, and the third $80. The Wild Goose has a tunnel in 200 ft, and have opened out breasts 65 feet wide, in ore all the way. They have now six men at work.

Candelaria District.

COLUMBUS CON.—*True Fissure*, Nov. 3: The drift from cross-cut No. 1 was advanced 10 ft during the week, and is in favorable looking ground. The face is showing streaks of good ore. The raise to connect the 150 level with the lower level of the old workings will be completed some time during the coming week.

MOUNT DIABLO.—The stopes below the tifird level are turning out the usual amount of ore. The stope above the west drift drift on the third level is yielding some ore of a good grade and the ledge shows improvement. A bullion shipment of $11,371.48 was made last Monday.

Esmeralda District

MT. CORY.—*Herald*, Nov. 10: There is no particular change to note at the Mt. Cory mine or reduction works. All things run smoothly at both localities, and are being pushed by all the power of skill and money. Car-loads of huge iron tanks and hoppers are coming in and are fowarded to the mill.

Ploche District.

BULLIONVILLE.—*Record*, Nov. 3: The toot of the B. S. Co.'s whistle, that for the past 3 years has called to work some 50 emyloyees, will be heard for the last time some morning of the coming week, as every thing that can be profitably concentrated is cleaned up around the old tailing pits.

CLOVER VALLEY.—There is quite a little excitement at Clover valley over the discovery of a rich prospect in the Bull valley country by old man Crow. The ledge is 6 ft in width, with rich ore running through it, from the thickness of a knife blade to an inch. We were shown one of those pieces that assayed $5,500 per ton.

MENDHA.—At the Mendha mine the damage caused the shaft by the late fire has all been repaired. A whim has been placed on the shaft and the hoisting of debris commenced. In a couple of days every thing will be in readiness for hoisting ore.

Ward District.

MONITOR MINE.—Reno *Gazette*, Nov. 9: The Ward *Reflex* of last Monday says: From William Baker, who came over from Taylor yesterday, we learn that the Monitor mine is opening out big in the south end. The ore body is 12 ft wide, pitches into the mountain in a southeasterly direction, at an angle of 45 degrees, and assays from $80 to $5,000. It is chloride, black metal and horn-silver. He says he would give $1,000 an hour for the privilege of working the mine, as it looks, with four men, and would then make more money than the owners of the mine.

White Pine District.

GRANITE GOLD MINES.—*News*, Nov. 3: Fred. Gotchett and George Judson shipped 36 ounces of fine gold last Monday, the product of 10 days' run from their little 2-stamp mill in Telegraph Canyon. These men have some very promising gold prospects in their mines in Granite district, some 20 miles south of Cherry Creek, in the Egan range. We have been shown some specimens from these ledges that were speckled all over with native gold. There is more ore in sight in 2 of these mines than the price asked for the property.

TOANO.—Parties in from the railroad inform us that quite a mining excitement is stirred up in Toano by the discovery of what seems be rich silver mines near that place. Many claims have been located, some of which show splendid prospects.

ARIZONA.

SILVER MOUNTAIN DISTRICT.—Prescott *Courier*, Nov. 6: The once immense Agua Fria district is now divided into 5 or 6 districts, embracing Tiger, Pine Grove, Silver Mountain, Lane, Humbug, Castle Creek, and some others. Silver Mountain district takes in a large spur of the Bradshaw Mountain range. Its ledges are very large. One of them, the Mammoth, is the largest in Arizona. It is bigger than the Vulture, but is not very rich in gold. For this reason, it was sneered at by ancient prospectors. It is a great many years since we first camped on it. At that time we would not have given 6 bits for it. To-day we have not sufficient money and property to purchase 50 ft of it.

NOTES.—Prescott *Courier*, Nov. 3: Curtis & Co. are drifting and sinking in the rich Lynx Creek gold mine. T. J. Eaman, Supt. of the Black Warrior mill and mine, is in the city. He brought in some bars of silver, which are now on the road for New York. Jolly Ben Robinson has been examining mines of Black Hills district. Thirty-six thousand pounds of bullion were shipped to Chicago yesterday, from the Howell reduction works. This makes the shipments for the last month 200,000 pounds.

RICH.—Wash Hanna and Jas. Elmore relocated the Crook mine. One ton and a half taken from the bottom of the 75 ft shaft yielded, by arastra process, the sum of $175. They have a bushel or more of specimens worth hundreds of dollars. The boys have "struck it," sure pop.

COLORADO.

SNOWDRIFT.—*Miner*, Nov. 3: Last Saturday 79 sacks of ore from the Thompson level of the Snowdrift were at the Pelican mill. The weight was 3 tons. The ore ran 308 ounces silver per ton, netting over $1,000. It was taken out by 2 men in 10 days, making the product from 1 stope alone over $100 per day. Wilson & Sheets are the lessees. This week they have been taking out more ore than ever, which they estimate will run from 400 to 500 ounces.

BISMARCK.—From the stope on level No. 3 in the Bismarck, 2 men working 4 weeks took out 53¼ tons of ore, that ran, first-class 414 ounces, second-class 150 ounces silver per ton. The men received nearly $800. In level No. 2, Henry C. Bates is sinking on a 12-inch streak of ore that runs 283 ounces.

LITTLE MATTIE.—*Gazette*, Nov. 3: The shipments from the mine for the month of October amounted to about 95 tons. The returns from 84½, up to Oct. 31st, reached $5,000. Fifty-eight men are employed on the property.

RED ELEPHANT.—*Courier*, Nov. 1: A new and promising prospect has lately been made on Red Elephant Mountain. It is called the Bedford lode, and is located about 175 ft above the Young America. Out of a 10-ft hole the ore run from 220 to 325 ounces silver per ton. Syster & Co. are the lucky ones.

VULCAN.—Sam. Worthington & Co., who are leasing on the tunnel level of the Vulcan, 600 ft from the mouth, are in big pay. They have struck from 2 to 3 inches of high-grade "stuff," the first-class of which mills 500 ounces, and the second-class 200 ounces silver per ton.

DIAMOND TUNNEL.—This gigantic tunnel is now 2,188 ft in length. Much interest is taken in the developments lately made on the first intersection of the Corty City veins which this tunnel cuts at 2,100 ft from its mouth. Thus far 4 distinct and well defined veins have been encountered within a distance of 50 feet of crosscutting. The production up to the present time of the lodes cut by this tunnel is as follows: No. 5 and E. K. Baxter lode, $350,000; D. T. No. 6, $160,000; Pelican and Dives, over $2,000,000, besides considerable production from smaller veins.

IDAHO.

ELKHORN.—Wood River *Times*, Oct. 31: The Elkhorn mine has paid the owners a net profit of $25,000 per month. I. I. Lewis, the superintendent, states that new developments have placed in sight large bodies of high-grade galena. The average net receipts for every ton of first-class ore shipped to the Philadelphia smelters is $165 after the deduction of transportation and reduction. Besides a regular daily shipment of 12 tons of ore, much is being done to give the mine complete drainage, by a tunnel which will tap the vein at a depth of 500 ft. It is expected that it will be finished by the first of next month.

BULLION.—The camp of Bullion is yielding the usual 50 to 60 tons of ore per day, which are brought to Hailey and shipped by rail to Salt Lake, Omaha, Kansas City. This production, which is apparently quite large, is not half as large as it could be if a local market were provided for our ores.

ALLEN GROUP.—The Allen group of mines, on Warm Spring creek, has again changed hands. But this time the purchasers are a Michigan syndicate of mining men who have had experience in the copper mines of Lake Superior. The consideration stated is $50,000. The sale was negotiated by James McGregor and Sam. D. Conner, who bought the Allen group last June, and who have since had a force of men at work opening up the property.

MONTANA.

SUMMIT VALLEY DISTRICT.—Butte *Miner*, Oct. 31: In the Magna Charta, the drift from the 200 level shows a good body of ore assaying about 42 ounces. On the 100 level the ore body lately struck still improves in quality and size as the drift to the east is extended. About 100 tons per day are being crushed.

POLLACK.—A 100 ton lot of ore now being worked is running at an average of 80 ounces.

CLARKE'S COLUSA.—In the drift from the old discovery shaft 150 tons of 30 per cent copper ore have been taken out, and while doing this there has been taken out 2 car loads of copper-glance assaying 70 per cent copper.

WASHOE.—*Inter-Mountain*, Oct. 30: What promises to develop into a very important strike was made on Saturday in the Washoe mine, at a depth of 212 ft. Mr. Leggat states that a fair sample taken yesterday assayed $46 in silver and 12 per cent copper, and he therefore knows that he has at least 9 ft of good pay ore. There is no reason why the ledge should not be as wide at the depth of 212 ft as when penetrated by the shaft near the surface. The Washoe is beyond doubt on the same great copper-silver belt as the Gagnon, Original and Parrot.

MOULTON.—On the 400 level on the south vein, which has lately been connected with the level above by a winze, some very productive stopes are being opened about 750 ft from the east end line. The ore shoot is wide and continuous and of excellent grade.

ALICE.—Yesterday Supt. Hall let a contract for the extension of a drift from the bottom of the 800 ft winze for a distance of 100 ft. In all the upper levels good ore has been struck east of the shaft, and there is no reason why the experience on the 800 level should be different. Drifting on the west 800 level on the north or hanging-wall side of the vein progresses on about 3 ft of 40 or 45 ounce ore.

ANACONDA.—At the great smelter, now being erected by the Anaconda Co. on the north side of the creek, every thing is being rushed ahead as fast as possible. The calcining furnace room alone is 469 ft long. The concentrator building has a frontage of 340 ft. In fact the size of the plant fills one with surprise, and it will be a matter of regret should the failure to get material cause a temporary stoppage of part of the work until the spring, which is likely to be the case.

NEW MEXICO.

DUG-OUT CAMP.—Silver City *Enterprise*, Nov. 2: There was an old adobe smelter lying idle in camp that was formerly used by parties in the business of counterfeiting Mexican dollars. A few weeks ago it occurred to Marsh, Smith, Burnett and Divine that the old concern might be utilized to advantage in reducing ores. It was patched up, a torn and leaky 28-inch bellows was pressed into service to furnish blast, and a trial run was made. The outcome was satisfactory. The bullion flowed freely, and after a seven hours' run the delighted owners found themselves in possession of 500 pounds of base bullion, carrying silver to the amount of $400 per ton. When the repairs now in progress at the adobe are completed, it will be capable of treating about 4 tons of ore during 24 hours.

FLEMING.—The Carrollton mill, under J. W. Fleming, is working to perfection. The 15 stamps are run day and night on Old Man ore of low grade. The high grade will be treated as soon as the supply of low grade is exhausted. Twenty tons daily are being worked, and 82 per cent of the assay value is being saved, the balance running into the tailings, which will be concentrated. All the available teams are hauling ore from the mine to the mill. High grade ore to the amount of $40,000 has been sold.

ARTHUR LEE.—On the Arthur Lee claim, in Cow Springs district, adjoining the property purchased by J. W. Fleming in Givens' Camp, Ben Laswell uncovered 12 ft of a 40-foot ledge, that from an average assay goes $55 silver and a high per cent in lead. The claim is owned by Col. Bennett, Martin Maher and Ben Laswell, who commenced work upon it but a few days ago. The ledge is a monster. Sample assays that run fabulously high have been made.

SIERRA GRANDE.—Deming *Tribune*, Oct. 31: Dr. Endlich in two months has uncovered low-grade ore enough to keep the mill in operation for two years at least; he has got the mill in perfect working order; he has received and put in operation the diamond drill; he has shipped over 1,200 tons of high-grade ore—725 tons during October; he has a completely organized working force of nearly 300 men; he has straightened out the muddled accounts, and has put the mines in condition for regular and satisfactory production. This has all been done without any flourish of trumpets.

OREGON.

MINERAL CITY.—Cor. of Bedrock *Democrat*, Oct. 31: They have struck it rich in the Black Maria mine. Assays from the bottom of the incline went $600 per ton. The Boone is looking fine, and assays $500 per ton. The shaft is down 40 ft, and shows well. The Muldoon is looking well. The owners are running a tunnel that will develop the ledge in good shape. The Egan and Nevada mines, lying side by side, look well; the owner is running a tunnel on the Nevada, and the ledge shows a large body of high-grade ore. The miners are in high spirits over the prospects. There has been a new discovery made in the last few days that bids fair to rival any thing in the camp. C. B. Gunn is the lucky boy this time.

NOTES.—Jacksonville *Times*, Nov. 2: The Sailor Gulch diggings near Waldo are being fitted up for an extensive run. Joe Epperson & Co., of Steamboat are putting their hydraulic pipe on some diggings on Applegate. Jack Layton is piping away at Farris Gulch. Hays & Magruder, who have good hydraulic mines on Rogue River, are making extensive preparations for winter. Saltmarsh Bros. inform us that miners of Sterling are ready to take advantage of the winter season. Curtis Bros. are working over the old tailings and ground on Jackson Creek. G. B. Caldwell was making some arrangements Monday for hydraulic pipe for the placer mines on Steamboat.

UTAH.

HORN SILVER.—Southern Utah *Times*, Nov. 3: The average weekly shipment of the Horn Silver Co. is 22 cars, valued at $66,000. Shipments since the first of January last to Oct. 19, $2,662,000; present total for the Horn Silver $2,728,000; and yet the stock keeps on declining in the face of the undoubted fact that the mine is better now than ever before.

The Salt Lake *Tribune* of the 6th says: A few days ago Major Goodspeed visited the Horn Silver mine, the first time since he experted the property 4 year ago. At his recent visit he made some very interesting measurements. By actual measurement he found the average width of the ore body between the fourth and sixth levels to be 70 ft, and the average length 150 ft, by 200 ft in depth, containing 2,100,000 cubic ft of ore. The dividends paid by the company up to date show that this $60 orc has yielded $20 per ton net profit. Therefore, between the fourth and sixth levels of the mine, in the 147,000 tons of ore there is contained $2,940,000 in dividends for the stockholders. At $60 per ton, the gross value of the ore now exposed between the sixth and seventh levels is $8,064,000; or, at $20 per ton, the net value of Horn Silver ore, $2,688,000, to be paid in dividends to stockholders. Up to the present time the Horn Silver has put out 150,000 tons of ore, and has paid $2,700,000 in dividends, besides buying into the Utah Southern railroad, putting up the smelter, and now having en route to New York several hundred thousand dollars' worth of bullion. According to Major Goodspeed's figures, there is ore in sight between the fourth and seventh levels to the gross value of over $17,000,000, and net profits of $5,628,000. He was asked to explain why the Horn Silver stock, in the light of these figures, has, within the past month, declined to $5.75 per share, and his answer was that there is a stock panic in the East. People, he says, have been so badly left on Little Pittsburgh, Chrysolite, Con. Virginia, and other high-priced mining stocks, that they will have no more mining investments at any figure.

PARK CITY.—*Record*, Nov. 3: At Daly's group, the new hoisting-works building is under cover and will soon be ready for the machinery. Work is to be commenced on the Barry Con. Mining Co.'s property next week, and sinking will probably be kept up all winter. The Uintah Mining Co. are making extensive preparations to work their property up Thayne's Canyon this winter. They are building a large tunnel house, and expect to run the tunnel 500 ft, to prospect the hill thoroughly.

WASHINGTON.

CŒUR D'ALENE.—*Inter-Mountain*, Nov. 3: The Cœur d'Alene excitement is still at fever heat in a good many places; yet, latest reports are to the effect that it is not only impossible to work the mines this winter, but extremely doubtful if the men now en route reach the mines or find accomodations when they are reached. The *New Northwest* publishes a correspondence from a man who attempted to reach the mines but failed. He talked with several who had been there, and nothing but encouraging reports were heard. Berry Davis' claim cleaned up ten ounces the last day's run, among which were two specimens weighing $10 and $14 respectively. But few claims were being worked with sluices, owing to the scarcity of lumber and lateness of the season. The most that was being done was locating claims and preparing for winter. Many of the claims were unprospected, and even their owners were not sure that they could "raise a color". Good judges estimate that at least ten out of every hundred that stay there this winter will die of pneumonia.

Poisonous and Troublesome Plants of California—No. 1.

Written for PRESS, by J. G. LEMMON.

Zygadenus Venenosus,

Poison lily, or so-called "Lobelia," or death camass.

"What ails my horses" is often heard in the agricultural valleys of the mountainous portions of California. The inquiry is always made by one not accustomed to the products of the country, and is answered by a citizen, "They have been eating lobelia; dose them at once with a handful each of salt."

The animals have suddenly become gaunt and colicky, weak, disinclined to travel, or to eat or drink. They groan, glare about them, dreul, and cough, perspire easily, breathe hard and frequently, with other signs of distress. Eventually they are affected with diarrhea, and often long sickness and emaciation follows, and not rarely death.

Usually salt, if administered at once, is a specific remedy, no other as yet being known.

The plant causing this distress, and often great loss, is often called by the farmers lobelia. It is, however, in no respect related to the lobelia family, but is a kind of melanthium, lately classed with the lilies. I suppose it was called "lobelia" because its effects are similar to that of the lobelia inflata of the East. Having once received the cognomen, it adheres, despite much effort on the part of the writer to correct the error and substitute "poison lily." Another popular name for the plant is "death camass," the name of camass being applied to the noted Indian food camassie esculenta, also a lily, often found in the same localities. The specific name of this species of Zygadenus being venenosus, is very appropriate, for it means poisonous. The plant grows sparsely in meadows, along with grass, sedges and other forage plants, maturing a little prior to them, but not too late to have its stalks with well loaded capsules of seed harvested along with the hay. The small, black seeds, in their leathery triple-pods, are supposed to contain the poisonous principle. This poison lily springs from a small deep-seated bulb, which is also possessed of a virulent poison. The Digger and Washoe Indians, who annually procure tons of roots from the same meadows where grows this bulb, are known to carefully reject the latter. However, in certain valleys it is said that hogs eat and thrive upon them, so they are called hog potatoes. This does not prove that the plant is not poison, for swine, it is well known, are unaffected by some kinds of most deadly poison, such as that of rattlesnakes, scorpions, etc. Farmers have been advised to dig up the bulbs and destroy them. The hog-rooting method is not to be recommended, for it destroys too much of the forage plants as well; and in certain very valuable meadows but little infested this could readily be done with a pick or a crowbar in early spring, when the lilies first appear.

Only horses are reported to be affected by this poison lily, though it is probable that other animals suffer from it, but naturally they are less in sight, and so escape notice.

Another lily similar to this, and perhaps as mischievous, is often mistaken for the one under discussion. This one is larger (two to three feet high), with yellowish-white flowers, and grows near meadows, on the dry, often stony, hard bluffs; never in the low, damp meadows, the natural habitat of the small white-flowered plant first described. The large one does not get into the hay, and so is not apt to be eaten in quantity.

Ranchmen whose hay contains poison habitually, suffer little or no trouble from it, either their stock rejecting the plant from their food instinctively, or by becoming proof against ill effects.

I am sorry to class this villainous plant with the generally beautiful order of lilies, but the great master, Dr. Gray, has declared it, and in it must go. The lily family is now a very large one, its characters having lately been carefully revised by the venerable Dr. Gray, and found to include four former orders now reduced to tribes; viz., smilaceæ, trilliaceæ, liliaceæ and melanthaceæ, comprising about 180 genera, with 1,900 species. Of these 50 genera and 235 species are found in the United States and British America.

The lilies are distributed well over the earth, principally in its temperate regions. In the tropics they become arborescent. The Dragon tree, dragœna draco, of the Canary Islands, being found 45 feet in circuit and 70 feet high. It yields the powerful astringent "dragon's blood." The properties of this great order are various, and range through every conceivable quality of usefulness or harmfulness.

The two first tribes, Smilaceæ and Trilliaceæ, contain but few species, all of which are innocuous but not edible.

The Liliaceæ or true lilies comprise four-fifths of the enlarged order, and include the most valued and splendid plants in cultivation. Their bulbs, however, usually abound in a bitter stimulant principle not to be trifled with. The magnificent "Crown Imperial" has a strong fœtid odor, and the bulbs are very acrid; and of the lovely tuberose, with its wonderfully abundant and sweet odor, it is wicked to have to say that when confined in a room it causes headache, and often death. However, among the lilies are some most edible bulbs, such as the onion, the "camass," or Indian potato of this Coast, and the asparagus.

The tribe Melanthaceæ are nearly all of them provided with drastic, narcotic, poisonous or medical properties, and to this tribe belongs our poison lily or Zygadenus. The tribe is principally distinguished from the other lilies by characters of the pericarp or seed vessel. It is produced in three erect tubular carpels, slightly adhering together at base and inclosing the seeds, as shown in adjoining cut. The other plants of this now great order have their three carpels united like valves, and forming a single three-celled seed vessel. All lilaceous or three-parted plants exhibiting the character of separated, distinct tubular carpels, may be regarded as suspicious. One of those claiming much attention on this Coast is the Veratrum Californicum, or California hellebore. This also grows in meadows, often in company with the Zygadenus described.

The plants often form dense thickets of large stout erect stalks, 2 to 5 feet high, clothed with large ribbed leaves like corn husks, the stalk upbearing a large open panicle of hundreds of greenish-white flowers. The green shoots in early spring are greedily eaten by all kinds of stock, and opinions are about equally divided concerning alleged effects. Perhaps the truth is the stock suffer from its use at first, then instinctively counteract ill effects by other plants which become an antidote. Instances are numerous where young cattle and sheep have suffered severe sickness and even death in large numbers, after they were known to have made a hearty meal from those sprouts.

The well known drug colchicum, growing in Western Europe, belongs to this tribe, and is a most powerful narcotic. Other plants are veratrum, poke-root, rattlesnake root, etc. rendering it quite proper to proscribe the whole tribe from careless experiments as food.



Seed Vessel—Natural Size.

ZYGADENUS VENENOSUS—POISON LILY.

JOHN W. MACKAY, the San Francisco millionaire, has gone into mining in Colorado, having bought the Hukill mines near Georgetown.—*N. Y. Graphic.*

TWELVE brigands have captured the Duke of Castellemore, at Tripoli. The brigands demand a high ransom for the body of the prisoner.

Mineral Statistics of Victoria.

The official statistics of the mineral productions of Victoria, which are presented year by year to both Houses of the Colonial Legislature, show that in 1882 the yield of gold maintained the improvement upon the production of the preceding year which that year showed upon 1880. The total quantity produced by Victoria last year, based upon the estimates made by the mining registrars, and on the amount of gold purchased by the Royal Mint and banks from private holders, was 894,486 ounces, being an increase of 35,636 ounces on the production of 1881. According to a memorandum prefixed to the returns by the Minister of Mines, the improvement is entirely due to the development of new alluvial mines in the colony, and he expresses belief that the further opening up of the basaltic areas in the localities where the improvement has occurred will for a long time continue to operate favorably upon the annual returns of gold. This prospect is satisfactory in view of the disappointment occasioned by the failure of gold fields in other parts of the world and the non-discovery of any fresh source of supply; but, although indirectly, no doubt, European countries must feel the benefit of any improvement in the production of the precious metal in Victoria, last year at least they would not appear to have received any direct benefit, for the quantity of gold exported was 54,460 ounces less than that shipped in the previous year. No explanation is given of the cause of this falling off, whether it was due to the colonial requirements prohibiting the export of a larger quantity of gold, or whether to some other cause; but there can be little doubt that, as the Australasian Colonies increase in wealth and population, more and more of their production of gold will be absorbed in internal uses.

The quantities of gold yielded by quartz mines and by alluvial mines, respectively, were 512,532 oz. and 352,078 oz., the former being a decrease of 7,018 oz. on the production of 1881, and the latter an increase of 38,250 oz. The sum of the two quantities we have named will be found not to agree exactly with the total yield mentioned previously, the difference representing the amount of gold purchased from private holders the source of which is not traced. Although the quantity of gold derived from quartz mines has decreased slightly, yet the average yield of the quartz obtained shows a small improvement. The parcels of which the mining registars received definite information last year produced an average of 9 dwts. .44 gr., as against an average yield of 8 dwts. 18.2 grs. in the preceding year. The richest district in point of yield of gold per ton of quartz continues to be Gippsland, which, however, only produces a small part of the total yield; its average last year was 1 oz. 4 dwts. 7 grs. per ton. The district of Sandhurst shows a marked advance both in its total production and in the average yield, and, taking both together, now ranks as the most important of the quartz-producing districts of the colony. Some interesting information is given as to the yield of quartz worked at considerable depths. The most noteworthy cases are the following: Quartz obtained at Stawell, from depths varying from 800 feet to 1,120 feet, yielded from 19 dwts. 14 grs. to 6 oz. 13 dwts. 19 grs. of gold per ton; while some stuff wrought in the Castlemaine district, at depths varying from 250 feet to 600 feet, yielded from 4 dwts. 3 grs. to 12 oz. 3 dwts. 1 gr. of gold. It is, unfortunately, not rendered plain whether the greater yield in either case was given by quartz procured at the greater depth, and it is worthy of remark that in other districts, where the quartz was brought from a distance from the surface much greater than in either of the cases just mentioned, the yield was by no means equal. The number of miners employed in the gold fields continues to diminish. The mean number at work during 1882 was 37,446, against 38,436 during 1881, or a decrease of 990, which is attributed to the gradual exhaustion of some of the old workings. The number of Chinese engaged in mining operations also continues to show a falling off, and on December 31st last there were 667 fewer employed than at the end of the year 1881.

So far as metals and minerals other than gold are concerned, it can not be said that Victoria has as yet been proved to be a rich country. The most important is tin. The quantity of the ores of this metal raised last year was 1,078 tons, which is a large increase upon the preceding year's production of 120 tons; and there are apparently prospects of a yet further development of this department of mining industry when the miners get settled down to steady work. It is, however, somewhat curious and instructive to read in the report from one district that certain revelations in connection with companies had had a most disastrous effect on the prospects of tin mining there, capitalists not caring to take the trouble to discriminate between the good and the worthless concerns, so that it was feared most of the tin-mining lease-blocks would be abandoned for want of the necessary funds to work them. As in 1881 so in 1882 no silver ore was raised in Victoria, but 20,343 ounces were extracted from gold at the Mint. The quantity exported amounted, however, to 71,446 ounces, while there would appear to have been only 18,350 ounces imported by the colony. The quantity of copper ore raised showed a small improvement on the previous year's production, but altogether it was only 692 tons. Attention would seem, however, to be directed more to the solution of the problem of extracting in an economic manner the gold contained in the copper than to the actual work of mining for copper. It is stated, that should some cheap means be discovered of separating the metals, the district where the copper ore was raised would prove to be one of the richest places in Victoria for mining. Of iron ore, 600 tons were raised against 1,092 tons in 1881. The remaining minerals worked in the colony do not call for particular notice from us, with the exception of coal. Since the possession of an abundant supply of fuel may almost be regarded as an essential to a country's prosperity, we are sorry to find that, so far as has yet been proved, Victoria is not rich in coal. Only ten tons were raised in 1882. Borings have been made at various points, but the results can scarcely be described as encouraging. It is not remarkable, therefore, that coal figures as the chief mineral imported. The trade of Victoria in metals and minerals other than gold is not large, the total imports last year having been valued at £564,824, and the exports at £53,155. The aggregate value of the mineral production of the colony since the first discovery of the gold fields to the end of 1882 amounted to £206,532,001, of which gold alone contributed £205,747,348. With mining operations carried on so extensively as they are in Victoria, it is natural that the question of explosives should receive considerable attention. From the report of the Inspector of Explosives we learn that dynamite and lithofracteur are the favorite explosives in most mines, and that few complaints are now heard of injuries or sickness being caused by their fumes. The principal part of the report is occupied with matters having a purely local interest, however, and of a character not likely to prove of concern to our readers.

THE Marysville levee system has been strengthened, and should be able to stand a flood several feet higher than the highest that has ever visited the city.

J. C. BANCROFT DAVIS has been appointed official reporter of the United States Supreme Court.

The Engineer.

Pullman Cars.

Through Pullman cars are now run between St. Louis and San Francisco, a distance of 2,440 miles. This is the longest continuous sleeping-car run in the world, with one exception. The Southern Pacific road, we believe, runs through-sleepers between San Francisco and New Orleans, a distance of 2,496 miles. A journey of 2,500 miles or so in the same car, on a continuous line, is something wonderful to contemplate, and yet is now an everyday affair.

A through fast line will soon be in operation between Paris and St. Petersburg. Arrangements have been made for running this train on the American plan, with Pullman sleepers, drawing and reading room and dining cars. The cars will be supplied with adjustable wheels, on account of the change of gauge at the Russian frontier, and the speed for the entire run is intended to be 56 miles per hour, not including stops—an extraordinary rate for so long a run. To those who have compared the miseries of a single day and night's ride in a compartment car with the ease and luxury of a journey of thousands of miles in a train on the American plan, it is only wonderful that the latter has not long ago been adopted on the great lines of Europe.

Probably the largest and most complete junction system in the world is that at Clapham, England, where the great railroad systems of London connect. The roads there lie together like the wires of a piano. Sixteen hundred trains a day run over them. But, unlike our own noisy stations and junctions, with our English cousins there is no shrieking of whistles, or clanging of bells. They keep their signals for their officials, and outsiders must expose themselves at their own risk. A tunnel-way for passengers connects the whole, so that no one is allowed to cross the rails except the employees, who grow foolhardy and now and then come to grief. On the average one man is killed every six weeks.

London *Truth*, in referring to the revolution now in progress in regard to railroad cars in England, says: "The French railroad carriages are the most uncomfortable in Europe. The seats are narrow, and the passengers are packed in them like herrings. In Germany and Switzerland, on the other hand, the carriages are roomy and comfortable; and unless the French find means to remedy this state of things they will infallibly lose the through traffic between England and Italy. If they want to hold their own they should have carriages somewhat after the model of the Pullman palace cars, running through from Calais to Genoa. Nothing but dire necessity ever leads a sane individual to pass a day and a night in the present French carriage."

Sources of Error in Spirit-Leveling.—Precise leveling in this country has been done by the United States Lake Survey, which has determined the elevation of all the great lakes, with a probable error of less than one foot; by the Coast and Geodetic Survey, which is carrying a line of levels across the continent from Chesapeake Bay to San Francisco; and by the Mississippi River Commission, which has a line from the Gulf as far north as Central Iowa, to be connected with Lake Michigan, and thence with the sea-level at New York. Mr. J. B. Johnson has been connected with some 900 miles of this work, and discusses the sources of error. He first classifies errors into compensating and cumulative. Then he treats them as, first, errors of observation, in the instrument or in the rod; second, errors from instrumental adjustment; third, errors from unstable supports; fourth, atmospheric errors, from wind, from tremulousness of the air caused by difference of temperature, and from variable refraction. He concludes that, with good instruments and proper care, thirty miles of line should be duplicated a month with one Y-level and a target-rod, and all discrepancies brought within five-hundredths of a foot into the square root of the distance in miles; or with the United States precise levels and speaking-rods, reading three horizontal wires, one instrument should bring the discrepancies within two-hundredths of a foot into the square root of the distance in miles.—*Jour. Ass. Engineers.*

More Railroads.—A project is on foot to build three more railroads in this state, the survey for one having already been commenced. This one will be an extension of the road at present running from Marysville to Oroville. It will be extended from the latter town to Big Meadows, Plumas County. The second road will extend from Rocklin, on the Central Pacific railroad, to what is known as The Bridge, thence to Cooperstown Ravine, then through Greenwood and Georgetown to Forneys, thus opening up a large fruit district. The third projected route will extend from Napa to Berryessa Valley, from which Lake County is easily reached. This road is to be constructed so as to connect Berryessa Valley with Napa, thus giving it an outlet to the bay.

Another Electric Railway.—The much talked of electric railway from Portrush to the Giant's Causeway, Ireland, a distance of about six miles, was opened on September 28th.

Useful Information.

The Properties of Oils.

M. Chevreul found metals to have, in certain cases, a remarkable influence on the oxidation of oils. Recently, the *Times* says, M. Livache has used, in this relation, finely divided metal—such as is got by precipitation—instead of metallic plates, and the effect is greatly increased. He thus tried lead, copper and tin, and found lead to have the strongest action. If precipitated lead moistened with oil be exposed in air an increase in weight is very soon observed, and this is greater the more siccative or drying the oil. With linseed oil, the increase of weight reaches a maximum in thirty-six hours, whereas, exposed alone to air the oil would take several months to reach the maximum. A solid and elastic product is obtained. With non-drying oils the increase of weight is much less, and takes much longer to be completed. The result in question, M. Livache points out, can not be attributed to a simple division of the matter, allowing more active circulation of air, for the same experiment made with various other substances in fine division does not result in any like increase of weight; the effect here is merely like that in the case of a thin layer of oil exposed to air. The change in the other case must be attributed to a direct action of the metal. He suggests what industry may derive certain advantages from the facts observed. Thus a rapid method is indicated of distinguishing drying from non-drying oils. Further, the heating of oils might be advantageously replaced by a circulation in contact with air, and in the cold state over iron or fine plates having precipitated metallic lead on their surface. The oils so obtained would be always less colored, and would retain great fluidity, while the objectionable odors and the danger of fire which attend the present mode of treatment would be avoided.

The Lead Pencil.—There is no lead pencil, and there has been none for fifty years. There was a time when a spiracle of lead cut from the bar or sheet sufficed to make marks on white paper or some rougher abrading material. The name of lead pencil came from the old notion that the products of the Cumberland mines, England, were lead, instead of being plumbago or graphite, a carbonate of iron capable of leaving a lead-colored mark. With the original lead pencil or slip, and with the earlier styles of the "lead" pencil made direct from the Cumberland mine, the wetting of the pencil was a preliminary of writing. But since it has become a manufacture, the lead pencil is adapted, by numbers or letters, to each particular design. There are grades of hardness, from the pencil that may be sharpened to a needle point to one that makes a broad mark. Between the two extremes there are a number of graduations that cover all the conveniences of the lead pencil. These graduations are made by taking the original carbonate, and grinding it and mixing it with a fine quality of clay in differing proportions, regard being had to the use of the pencil. The mixture is thorough, the mass is squeezed through dies to form and size it, is dried, and incased in its wood envelop.—*Scientific American.*

Improvement in Chimneys. — The best chimneys are made by inclosing hard baked glazed pipe in a thin wall of bricks. Such chimneys will not only draw better than those made in the usual way, but there will be less danger from "defective flues." A four-inch wall of bricks between us and destruction by fire is a frail barrier, especially if the work is carelessly done or the mortar has crumbled from the joints. To build the chimneys with double or eight-inch walls makes them very large, more expensive, and still not as good as when they contain the smooth, round flues. To leave an air chamber between them for ventilating is better than to open directly into the smoke flue, because it will not impair the draught for the fire, and there will be no danger of a sooty odor in the room when the circulation happens to be downward, as it will be occasionally. The outside chimney, if there is one, should have an extra air chamber between the very outer wall and the back of the fireplace, to save heat, a precaution that removes to a great extent the common objection to such chimneys. A very large per cent. of fires come from defective chimneys.

Water-Proof Canvas.—According to the *Milling World*, sackcloth or canvas can be made as impervious to moisture as leather, by steeping it in a decoction of one pound of oak bark with fourteen pounds of boiling water. This quantity is sufficient for eight yards of stuff. The cloth has to soak for twenty-four hours, when it is taken out, passed through running water and hung up to dry. The flax and hemp fibers, in absorbing the tannin, are at the same time better fitted to resist wear.

Caring for Harness.—This is the season of the year when every person using a harness should see that it is properly cleaned and oiled, to secure its durability. If this were done there would be a great saving in the wear of it as well as in the comfort of the horse, which, above all other things, should receive the best of attention. There are many who get a new harness and wear it out in a short time, just for the want of a few good oilings. The more it is used in mud and rain the more care it should have. To clean a harness, take a small tub of lukewarm water, dissolve about two ounces of sal soda, and when your harness soaks a short time you can make quick work of it with a stiff scrub-brush. When almost dry, use good oil freely.

Cleaning Gilt Objects.—Gilt articles, if of metal, may be cleansed by rubbing them gently with a sponge or soft brush moistened with a solution of half an ounce of potash, or an ounce of soda, or, perhaps best, an ounce of borax, in a pint of water; then rinsing them in clean water and drying with a soft linen rag. Their luster may be improved in certain cases by gently heating them, and then applying gentle friction with a soft rag. A very dilute solution of cyanide of potassium will answer the same purpose, by applying it in the same manner as above, washing in water and finally drying by gentle friction with a linen rag; but as this substance is very poisonous, it is not to be recommended for household uses. Gilt frames of mirrors, pictures, etc., should never be touched with any thing but clean water, gently applied with a soft sponge or brush.—*Manufacturer and Builder.*

Railroading in Europe and America.—What is known as the Vanderbilt railroad system, when completed, will, it is stated, be the greatest system in the world, and reach the most productive agricultural, manufacturing and commercial territory in this country. It now consists of the New York Central and Hudson River railroad, 450 miles and four tracks; Lake Shore, 550 miles double track; Canada Southern and Michigan Central, 550 miles double track; Northwestern, 4,500 miles; Nickel Plate, 550 miles; or a full 66,000 miles of double and quadruple track, not to speak of thousands of miles of side tracks, etc. In addition to his large interest in each of these railroads, Mr. Vanderbilt has blocks of Rock Island and Burlington stock.

Germany's Linen Industry.—Half a century or so ago Germany controlled the linen markets of the world. Then the industry was crushed down by war in the Fatherland, and Great Britain stepped in and monopolized the foreign business. Wars having ceased, Germany gathered herself together, and what is the result? During the last twenty years the industry has increased in Germany 300 per cent. In Great Britain it has decreased eighteen per cent. Germany now employs 200,000 persons in flax-spinning, and Great Britain 150,000. The wages in both countries are about the same, but the purchasing power of the money is greater in Germany, and the condition of the operatives is in every way better than in Great Britain.

Good Health.

The Wholesomeness of Canned Foods.

There is much apprehension among many respecting the possible poisoning of canned food, now so largely used, by the action of the acids contained therein on the metal of the cans, or the solder used to seal them. This apprehension is doubtless not altogether without foundation in fact; but if the results reached by Mr. Francis P. Hall, and reported in the *Popular Science Monthly*, are to be believed, there is little to be feared on the score of poisonous adulteration of food from these sources.

The report in question refers to a series of experiments undertaken by Mr. Hall on the action of the vegetable acids—acetic, tartaric and citric—on lead and tin, and, as our contemporary puts it, "the results seem hardly to bear out the assertions that are made respecting the danger of lead-poisoning from tinned goods." It is stated by the investigator that the most danger arises from the solder, and from the action of the acids on the tin itself. He found that the rate at which corrosion takes place does not bear a direct relation to the strength of the acids, but that, in the case of canned fruits, it takes place very rapidly after opening the can, indicating, therefore, the advisability of emptying a can at once after it has been opened.

Mr. Hall also reports as the results of his examinations of bright tin-plate that he has not discovered, in even the cheapest specimens, sufficient lead to warrant the inference of intentional adulteration. He finds that tin foil, often used as a wrapping for various articles of food, is sometimes very pure tin, and again is heavily adulterated with lead.

These conclusions, which appear to have been reached after a faithful series of examinations of the several grades of tin-plate entering into the manufacture of cans for preserved food, should serve to assure those who may be apprehensive of the danger of lead poisoning from this cause, that it is far less serious than has frequently been affirmed.

An Alleged Cure for Hydrophobia.—Some interest is felt on the assertion lately made, on the authority of a leading physician, that the "woorari," a poisonous drug prepared and used by a number of tribes of South American natives, was a certain specific against the terrible and hitherto incurable disease known as hydrophobia. Several authentic cures are reported to have been made with its aid. Little is known of the method of concocting this subtle substance, and but little of its nature, save that it is highly poisonous; and doubtless a number of substances are prepared and sold by this name. The natives use it as a specific against the bite of venomous serpents, and also upon the tips of their arrows and other offensive weapons. In poisonous doses it produces paralysis.

In Germany, Dr. Offenberg recently attracted the attention of the medical world by successfully treating a hydrophobia patient with a species of woorari obtained from the Indians of Brazil. The announcement of this fact soon attracted attention in this country, and similar trials of the remedy here, as above stated, have proved equally satisfactory.

It would prove a boon, indeed, to humanity should these very hopeful assertions prove to be correct. It would add another to the many beneficent services of medical science, and it would rob of its horrors one of the most terrible and fatal of diseases.

Bad Teeth and Dyspepsia.

While every one is liable to suffer, at times, with indigestion, no matter how well preserved their dental organs may have been, there can not be found to-day one whose teeth are decayed, broken off, and out of order generally, that does not suffer continually with "heartburn," or some of the multifarious gastric troubles incident to such a condition of the oral cavity.

Persons having no teeth, or those whose teeth have been neglected and allowed to become diseased, are unable to masticate their food properly, which is deficiently mixed with saliva (a very essential auxiliary in the digestion of solid substances); and therefore, this food, being carried into the stomach without proper trituration and insalivation, imposes double duty upon the gastric apparatus—that of mastication and digestion.

Again, carious teeth serve for lodgment of particles of food which are retained in and about the organs until fermentation is set up. Friends, did you ever think of it, those whose teeth are rotten and rotting, that your mouths are regular cesspools? And this putrescent matter is conveyed into the stomach continually with the saliva, and consequently produces an irritation of the lining membrane, which is the worst and not uncommon form of dyspepsia, which is impossible to cure (not with even 999,999,999 patent medicines now in the market) until the dental organs have first received proper attention. Indeed, cases of dyspepsia of years' standing have been permanently cured by judicious attention to the oral cavity, and without medicinal agents to any extent, when, on the contrary, all the medicines that can be given will not effect a cure until the *cause* is removed.

Nay, more than this: in all mouths where there are tartar-covered and decaying teeth there are millions of *leptothrives buccalese* (*microscopic parasites*) which are also carried into the alimentary canal, and it may be produce other complicated diseases the origin of many of which are now unknown.

How Salt Injures Flesh Foods.—A French physician, Dr. Hussen, has been making experiments to discover the effects of salt and other condiments when used in cooking, and adds his testimony to the facts already in possession of the hygienists. His experiments show, among other things, that in cooking butchers' meat only an ounce of salt should be used with from six to twelve pounds of meat. If more is employed, it will do one of two things: it will modify the structure of a portion of the muscular fiber so as to render it more resistant to the action of the gastric juice, or it will itself check and retard the peptic fermentation, the very groundwork of digestion. It follows that salted and smoked meats are more indigestible than fresh. Vinegar, it appears, may be used with good effect, provided it is not in a quantity to irritate the stomach, and it is a pure dilution of acetic acid, freed from sulphuric or hydrochloric acids; the latter of which, though an active principle of the gastric juice, must not be in excess in the stomach, or it will retard digestion. The hungry man will, therefore, be careful how he uses salt and vinegar, and Dr. Hussen will by and by tell him something about pepper and mustard.

Cold Drinks in Indigestion.—Sufferers from certain common forms of indigestion forget the effects of loading the stomach with cold liquids. Cold drinks are often depressing, and the peculiar form of indigestion just now very prevalent, in which food is retained an unreasonable time in the stomach, is in a large proportion of instances the direct effect of persistent chilling of the gastric organ by copious draughts of cold drink.

Dangerous Cosmetics.—Dr. C. H. Von Klein has made the observation that the cutaneous irritation so frequently found upon the foreheads of fashionable ladies is the result of the quince-seed mucilage used for the purpose of arranging the "bangs" and other nonsensical flub-dubberies.—*N. Y. Med. Times.*

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Saturday Morning, Nov. 17, 1883.

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Passing Events.

Among miners just now the Coeur d'Alene placers, Idaho, are attracting the most attention. Miners are leaving Salt Lake now with the intention of being on the ground early in Spring; and some persons suppose that by May next there will be 1500 or more prospectors in the region. Miners from Montana, Wood River, and elsewhere are preparing to go.

The Manufacturers' Association, to which we have before referred, has regularly organized and incorporated, and we give elsewhere a statement of its purposes. It will be in a position to accomplish much good to the manufacturers of this city and vicinity when in full running order.

The whaling fleet is coming in one vessel after another, and in a few days all the Arctic whalers will be in this port. The steamers have had the best luck, though the catch has been poor all around. It is probable that more steamers will be built here. A large factory and refinery is to be put up here, a local company having been organized for the purpose. It is probable that San Francisco will do the bulk of the whale oil trade of this country hereafter.

At the Alta mine, on the Comstock, they are now going down to the 2150 level to stay. They are taking down with them a supply of pure air by means of a partition that is being placed in the main shaft. As fast as the planks of this partition are put in position, there is a following draft of cold air down on one side and up on the other.

Cross Lodes.

This is the season for doing assessments on mining claims for the year now drawing to a close, and a great deal of such work will be done before the last day of December next. The law upon this point is now generally well understood, and we do not deem it necessary to enlarge upon the subject. The law requires an annual expenditure of $100 in improvement upon each claim, and unless such a sum is actually expended in good faith, within the prescribed period, the claim is subject to relocation.

The question of rights of miners in reference to cross lodes is, however, not so generally understood, and as many such cases exist, in which the claimants of cross lodes continue to do the assessment work, some honestly believing themselves entitled to the lode "to the point of intersection of the main lode," and others holding on simply for blackmail purposes, we propose to give, for the benefit of all, the law and the latest decisions on cross lodes.

Section 2322, General Mining Laws of the United States, is as follows: "The locators of all mining locations heretofore made, or which shall hereafter be made, of any mineral vein, lode, or ledge, situated on the public domain, their heirs and assigns, when no adverse claim exists on the 10th day of May, 1872, so long as they comply with the laws of the United States, and with state, territorial and local regulations not in conflict with the laws of the United States governing their possessory title, shall have the exclusive right of possession and enjoyment of all the surface included within the lines of their locations, and of all veins, lodes, and ledges throughout their entire depth, the top or apex of which lies inside of such surface locations; but their rights of possession to such outside parts of such veins or ledges shall be confined to such portions thereof as lie between vertical planes drawn downward, as above described, through the end lines of their locations, so continued in their own directions that such planes will intersect such exterior parts of such ledges; and nothing in this section shall authorize the locator or possessor of a vein or lode which extends in its downward course beyond the vertical lines of his claim to enter upon the surface of a claim over or possessed by another." And section 2336, referring to cross lodes, reads as follows: "When two or more veins intersect or cross each other, priority of location shall govern, and such prior location shall be entitled to all ore or mineral contained within the space of intersection; but the subsequent location shall have the right of way through the space or intersection, for the purpose of convenient working of the mine; and where two or more veins unite, the oldest or prior location shall take the vein below the point of union, including the space of intersection."

We can give no better nor clearer explanation of these sections than to quote the gist of a recent decision by the United States Court of Colorado, in a case of cross lode controversy, in which A had made a location on a main vein, and subsequently another location upon a cross lode which intersected with the vein of the first location. He sold the first location to B, and afterwards laid claim to the ore in the cross lode within the surface lines of the first location, which he had sold to B. The case was tried by the State Court of Colorado, and decided in favor of A. B then appealed the case to the United States District Court, which tribunal reversed the ruling of the State Court, and in doing so gave the following explanation of the law, which has been accepted, according to our information, by all the United States Courts: "The act of 1866 allowed surface ground for the convenient working of the lode or vein, and for no other purpose." The Act of 1872 enlarges the rights of the locator by a grant "of all veins, lodes and ledges, the top or apex of which lie within his surface lines;" still his right to surface is dependent upon his right to the principal lode, and his right to other lodes within his surface limits is equally dependent. This enlargement of the rights of the locator was doubtless intended to stimulate his enterprise by increasing his reward; but the controlling reason was to prevent the controversies which were constantly arising respecting veins or lodes connected or associated with the lode claimed. These controversies obstructed the full and proper enjoyment of the principal lode granted, and the design was to settle and prevent them. In this, and in the case of surface ground, it was intended to grant that which was associated with the principal lode by proximity within prescribed limits. A mineral vein or lode is a term in both acts. There must be a Code discovered and appropriated by compliance with the requisites of location. This is the prominent and pronounced subject of the grant. This is what the miner had discovered and claimed by right of discovery. The security of his title thereto was the practical necessity with which the Act of 1872 dealt. All else we think incident thereto—under the Act of 1866, the right of the surface ground; under the Act of 1872, both the right of the surface ground and to other veins, lodes, and ledges. The principal lode constitutes the measure of the miner's right to the surface ground, as the surface ground, when determined, in turn constitutes the measure of his right to other veins, lodes, and ledges.

Recollections of California Mining Life.*

Men and Events in the Pioneer Days—No. 2.

[Prepared for the MINING AND SCIENTIFIC PRESS, by HENRY DEGROOT.]

Why Fremont Failed to Discover Gold.

Having in a preceding number of these papers related all that was known as to the existence of gold in California prior to January, 1848, we come now to consider some of the principal actors in, and the circumstances that led to, that event. Before entering upon this subject, it may, perhaps, be proper to state that some surprise has been manifested that John C. Fremont failed to discover gold at an earlier date, seeing he was sent out by our government to explore the country, was accompanied by a competent mineralogist and geologist, and arrived here nearly two years before the find occurred at Sutter's mill. It is argued that, having been dispatched on such special mission, and being aware that some placers had previously been found and worked in the southern part of the state, he ought to have struck gold somewhere along his route, inasmuch as it led down the south fork of the American River, on which the great discovery was afterwards made. But to this it may be replied: General Fremont, with his command, consisting of sixty-two frontiersmen, scientists and guides, entered the country in an exhausted and famished condition, having been forced to slaughter his pack animals to save himself and his men from starvation, and to cross the Sierra in the dead of winter. He was therefore obliged to push on to Sutter's Fort with all possible expedition, and having stopped there for a few days to recuperate his men and animals, he hastened forward to Monterey. Arrived at that place, then the capital of the Department of Alta California, the Mexican authorities, suspecting that Fremont meditated some revolutionary movement, at once attempted to drive him and his party out of the country. What with resisting this attempt and the active part he took in effecting the conquest of California, the Great Explorer had quite enough on his hands for the next two years, without thinking about or hunting after gold. That General Fremont actually did make an important discovery of gold, and refrained from giving publicity to the fact, as a few have surmised, is, for obvious reasons other than the above, a hypothesis with hardly the shadow of a reason to rest upon.

General John A. Sutter.

The most prominent character connected with the epoch in California history under consideration, and the most noteworthy of all our pioneers, was born in Switzerland, in the year 1805. Bred to the life of a soldier, after distinguishing himself as a captain in the armies of France, he emigrated to the United States. Arriving at New York in 1834, he at once proceeded west, going as far as New Mexico, where he tarried for a time. Not liking that country and having heard much of California, he joined a party of trappers and crossed the continent, going, contrary to his intention, first to Oregon. From the rebe took ship to Honolulu, whence he voyaged in like manner to California. This circuitous route was taken to reach his point of destination for the reason that there were then no vessels running between Oregon and Yerba Buena, while the overland journey was one not easily made. On reaching California our adventurer at once made his way up the Sacramento River, and there, near the junction of that stream and the American Fork, erected, in August, 1839, the fort that afterwards bore his name, he having been guided to this spot by the descriptions of the old beaver hunters, with whom it had been a favorite camping ground, and who had recommended it to him as an eligible site for an agricultural establishment and trading post.

This accomplished, Sutter engaged in carrying out his purpose of growing wheat and manufacturing it into flour for the Russian settlement at Bodega, and of raising horses and cattle on an extended scale. For effecting his plans, a flouring and a saw mill became necessary. The former, a large three-story frame structure, was built only a few hundred yards without the walls of the fort. The nearest place at which timber suitable for making good lumber could be obtained being on the south fork of the American River, distant about 35 miles from the fort, Captain Sutter determined to put up a saw mill at that point. The business of getting out the timber and constructing this mill was intrusted to

James Wilson Marshall.

Who, assisted by a small company of white men and Indians, commencing work in the fall of 1847, had the building about completed and ready for running by the end of that year. Marshall, who was born in New Jersey, in 1812, and brought up to the trade of his father, a coach and wagon maker, emigrated, when about twenty-one years of age, to Indiana, where he worked for a time at carpentering. Leaving that state, he sojourned for a while in Illinois, whence he made his way to the Platt Purchase, in the state of Missouri. Here he engaged in farming and trading, and being tolerably prosperous, made up his mind to settle permanently. But a severe and protracted attack of fever and ague shook this good resolution out of him, and, as a means of escaping the dread disease, he finally concluded to come to California. This determined upon he made due preparation, and joining a company having a train of a hundred wagons, left about the first of May, 1844, on his journey overland. As the safest way for reaching California, Marshall with a portion of the company, took the route through Oregon, where they wintered, and starting out the next spring came on to California. Reaching Sutter's Fort in the month of July, 1845, Marshall there made a halt, working afterwards most of the time for Captain Sutter.

When the Bear Flag war broke out Marshall joined the American party, and did good service in the field. Hostilities ended, he returned to the fort and was soon after employed to take charge of the mill-building business, an enterprise that he had some time before strongly urged Captain Sutter to engage in.

Finding the Gold.

In regard to this event there are several versions extant. All, however, agree as to the main facts, their differences relating for the most part to unimportant particulars. Marshall's account of this affair, which has been generally accepted as entitled to credence, is about as follows: Finding the race he had dug below the mill not quite deep enough, he had adopted the plan of hoisting the gate and letting on a full head of water, for the purpose of washing it out to a greater depth. Walking down the race one morning to see what progress he was making with this work, he noticed a small piece of yellow metal lying in a crevice of the soft granite, which at that point composed the bottom of the race. Picking it up, he began to ponder what it might be, having an impression from the first that it was gold. Its weight and the crude tests he was able to make of this metal—such as pounding it between two stones and finding it malleable—so tended to confirm this idea that Marshall thought it best not to say much about the matter just then, for fear it might cause the men employed under him to quit work and go to gold digging. But for all that the notion that this metal might be gold gradually spread among the men, who failed not to notice that Marshall continued to look after and pick it up, he having in the course of a few weeks collected from the mill-race several ounces of it. This incident, afterwards fraught with such momentous consequences, occurred on the 19th day of January, 1848—not 1849, as stated in Hittell's excellent and generally accurate work on California—this error in date being a mistake of the printer, and not of the author.

Peter Wimmer, who was with Marshall when he found the first piece of gold, had also gathered a small quantity. Taking a portion of this, his wife, who did the cooking for the men, had subjected it to to what was considered a crucial test, boiling it in a decoction of strong lye. As the stuff stood this trial without tarnishing, it was concluded on all hands that it must be gold; and so a feeling of interest began to show itself among the employees about the mill, despite the efforts of Marshall and Wimmer to conceal the real facts and suppress the growing excitement.

Meantime, Marshall having occasion to go to the fort, took some of the metal he had collected along with him, and showed it to Captain Sutter, who proceeded to test it with nitric acid, whereby its true character was fully established. Comprehending the importance of the find, Sutter accompanied Marshall on his return to the mill, where he soon satisfied himself that the precious metal existed in such quantity as would be likely to work an early revolution in the then existing state of things. Nevertheless he found the men still at work, and affecting to treat the gold find lightly, managed to keep them busied for some days longer, until the mill was fully completed and a small stock of logs gotten in.

By this time the news of the discovery had reached San Francisco, to which place a man named Bennett, one of the hands at the mill, had gone, taking some of the gold dust with him. Among others who happened to see this sample was Isaac Humphrey, who, having formerly worked in the gold diggings of Georgia, as soon as he beheld it not only pronounced it good gold but expressed the opinion that much more would be found where this came from. Such was the confidence of this Georgia miner in the new discovery that he left San Francisco about the end of February, and in company with Bennett went up to the mill. Arriving there on the 7th of March he found the men still at their work, none of them having as yet gone to gold digging. After prospecting a little with a pan, Humphrey constructed a rocker, such as he had been accustomed to use in Georgia, and, commencing on dirt taken from the mill race, washed out from one to two ounces of gold dust daily.

The News Spreading, and Its Effect.

This result of Humphrey's few days' washing put an end to all further operations on and about the mill. Work of every kind was in fact abandoned, all the whites in the vicinity building rockers and betaking themselves to gold washing. Even the mill, which Sutter and Marshall had so exerted themselves to complete, for a time stood idle. Getting in logs came to an end; building ceased; every thing but gold digging was for the time being suspended. Everywhere, as the tidings spread, business

*This series of articles will be issued in a new form, with other matter, during January, 1884.

came to a standstill. San Francisco was emptied of its adult male population. The American settlers residing in the valleys geared up their teams and set out for the mines, some of them taking their families with them. The rancheroes and the vaqueroes mounted their mustangs and started for the new El Dorado, driving their pack animals before them. And thus the country, before so quiet and inanimate, was now all astir: the whole population being moved by a single impulse—the eager thirst for gold.

So extensive was this movement, which may be said to have commenced about the middle of March, that there were collected in the mines before the end of the year as many as ten or twelve thousand men. While the most of these were residents of California, many of them came from Oregon, Mexico and the Sandwich Islands, with a few from Central and South America. As population flowed rapidly into the mines, so also was the business of gold gathering speedily extended over a broad stretch of country, having been in the course of a few weeks engaged in at widely distant points. Coming to Sutter's Fort about the middle of March, from his ranch at the head of the Sacramento Valley, Pearson B. Reading visited the site of the new gold discovery. Finding the appearance of the country similar to that in the vicinity of his ranch, he returned home, and taking his domesticated Indians, was engaged before the end of the month washing out gold on Clear Creek, nearly two hundred miles to the northward of Coloma. John Bidwell, another large ranch owner in the Upper Sacramento Valley, having, in like manner, visited Sutter's Mill, returned and went to work with his Indians on the bars of Feather River, nearly midway between Clear Creek and Coloma. Towards the south the gold-seeker also made his way, pushing out in that direction as far as the Tuolumne before the season was over; so that mining by the end of the first year was being pursued at intervals along a linear extent of more than two hundred miles.*

Manufacture of Charcoal in Kilns—No. 3.

Conical Kilns.

The conical kilns are generally smaller than either of the other varieties before described. They are usually from 20 to 25 feet in height and from 25 to 30 feet in diameter, and are intended for 25 to 45 cords of wood. They are constructed in such a way as to require no bracing of any kind. They are often built into the side of a bank, a part of the earth of which is removed so as to make a charging-door near the top on a level with the ground; or they may be built on a plain, in which case there is no upper door but only a charging hole in the top, which is reached by a ladder in order to close it.

The usual dimensions of these kilns are:

	Diameter at base, feet.	Height, feet.	Capacity, cords.
American Fork Canyon Utah	26	20	25
Norton's Iron Works, Plattsburg, N. Y.	30	20	35
Wassaic, N. Y.	30	23	40
Readsboro', Vermont	28.6	28	45

There are three types of this kind of kiln, shown in Figs. 6, 7 and 8. 1. That at Readsboro', Fig. 7, in which the top of the cone is at a different angle from the bottom; there are two doors of the same size for charging. 2. That at Wassaic, Dutchess County, N. Y., Fig. 6, in which the cone has but one angle; there are two charging doors of slightly different size, and a hole in the top of the kiln to be used in firing. 3. That at Plattsburg, No. 8, in which the conical form is the same throughout; there are two charging doors, one below, and the other in the top of the kiln. This last form is on the whole the best of all, being the simplest in construction and easiest to manage.

At Readsboro', Vt., Fig. 7, the walls are 12 inches thick at the bottom, but at a height of 7 feet 4 inches they diminish to 8 inches. From this height upward all the bricks are laid in headers. At the height of 23 feet the kiln is capped by another cone, which is 5 feet 4 inches high, and of much flatter angle. The details of construction are different in different localities, but the principle of all the kilns is the same. At Wassaic, Fig. 6, the walls are made 30 inches thick at the bottom, diminishing gradually to 14 inches at the top, which is made flat for a cast-iron vent-hole. On one side a doorway, 7 feet high and 6 feet wide, is built out, into which a sheet-iron door fits against flanges made for the purpose. On the line of the American Fork Canyon railroad the bottom walls are carried up vertically on the outside to a height of five feet, where there is an offset. At the bottom the walls are 18 inches thick; at the offset they diminish to 1 foot in thickness. The interior is, however, conical throughout. The foundations are of the same thickness as the lower walls, and, as they are in earth, are 10 feet in depth.

At Norton's Iron Works, near Plattsburg, N. Y., Fig. 8, the wall is built with a batter 3 inches to the foot up to 5 feet. At this point, the height of the kiln being determined as 20 feet, a perpendicular is raised, and somewhere on this line a center is found from which an arc of a circle will meet the flange of the charging hole at the top, which is made of a cast-iron ring 4 feet in diameter and 8 inches deep, projecting 6 inches over the top. This makes the wall a little thinner at the top than the bottom. The flange of the ring is normal to the curve of the masonry, which is generally built of red brick (Fig. 8 shows the way this kiln is constructed). Sometimes the kilns are made of stone, which need only be strong enough to resist the low heat of the operation. Constructed in this way the kiln requires no braces of any kind. When the kiln is built against the side of a hill, the upper charging door is generally made of the same size as the lower one, but in Utah it is only 4 feet square. These doors usually have iron frames. Sometimes the upper part of the door-frame is directly under the top of the cone, as at Wassaic, Fig. 6, and in Utah; the lower one is then on a level with the bottom of the excavation made in the side of the hill. Sometimes the upper door is much lower, as at Readsboro', Fig. 6, and is connected with the woodyard by means of a bridge. At Plattsburg the kilns are built on a plain—the top opening is reached by a ladder. The discharge door is square, and has a cast-iron frame 6 feet high and 4 feet 6 inches wide. It is best to put in at the top of this door-frame a rod ¾ of an inch in diameter, to prevent the tearing of the wall by expansion. The door itself may be in one or two pieces.

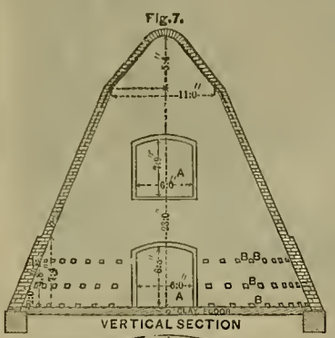


Fig. 7.

CONICAL CHARCOAL KILNS

Scale of Feet

0 5 10 15

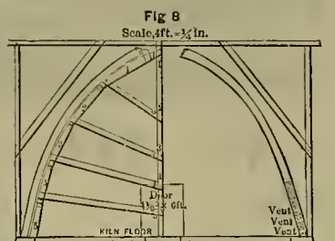


Fig 8

Scale, 4ft. = ½ in.

CONICAL CHARCOAL KILN

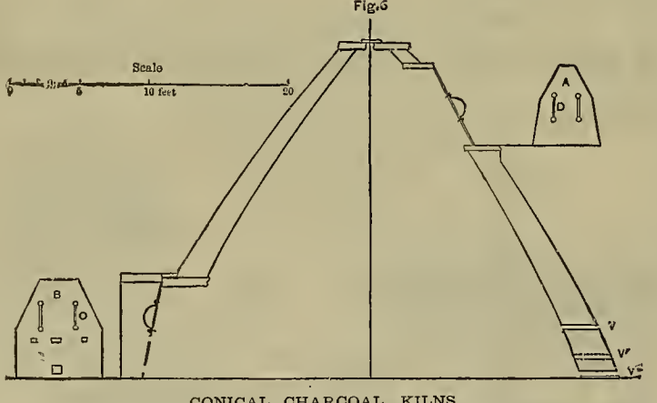


Fig. 6

CONICAL CHARCOAL KILNS.

It takes 33 M. Brick to construct the Plattsburg kiln. About 40 M. brick to build the one at Readsboro'. The floor of the kiln is very nearly level, and on the sides comes up to the bottom of the lower tier of vents. It is usually 4 inches higher in the center than at the sides. It is generally made of clay 8 to 12 inches thick, and must be well beaten with mauls and very carefully tempered. The kiln has 3 rows of vent-holes, which usually commence on the level ground.

Each kiln is usually constructed to hold 35 cords of wood, solid measure. This is intended to yield 1,750 bushels, which is 50 bushels to the cord. Either soft or hard wood can be burned; the former is generally used in the manufacture of blooms, and is preferred by many workmen.

To charge the kiln, skids two inches in diameter are laid three feet apart, keeping the ends up to the outside. They must be placed in the radii of the circle, for if the smoke is at all confined it will cause an explosion. The wood used is cut 4 feet 8 inches long, and is of all sizes from four inches to two feet in diameter.

A fireplace or chimney four feet square is made in the center of the kiln, and carefully preserved in the filling to the top. An air-channel is made from it to the opening in the lower door. This is filled with shavings, brands and light wood, thrown in loose, which when the kiln is lighted is fired with a long pole from the door.

The yield of the kilns at Norton's Works is often as high as 60 bushels per cord for hard, and 50 for soft wood. The average is about 50 bushels.

There are 13 kilns here, and 4 at 12 miles distant, built of firestone, which hold 50 cords each. It requires 8 men for the 13 kilns. These 13 kilns can make 22 turns a year. Working an fast makes it difficult to burn the charcoal thoroughly, so that they usually run only 18 kilns a year. It requires 13 days to fill, burn and empty a 35-cord kiln. It takes one day to fill, and one to empty it.

In Utah the charcoal is packed in bags, containing 2 to 3 bushels, which are hooked up under an opening 18 inches square in a table 3 feet high. This table is 4 feet square on the top. The charcoal is thrown on to the table and pushed into the bags. Six men will empty a kiln, sack the charcoal, and put it on the cars in one day. The wood is mostly poplar, which is cut dead. The charcoal is very light, and so much was lost by this method that it is now proposed to ship, in cars constructed for the purpose, without packing. It takes 9 to 10 days to burn a kiln. At the end of 5 days all the vents are closed, and they no longer watch it. The fire is extinguished with water; it is not allowed to die entirely. The kilns are whitewashed after every operation. Poplar costs $3 per cord. Pine costs $3.75 per cord. Six men do all the work. The loss in fine coal is very large. The charcoal made from those very soft and often dead woods is very light, so that it crushes by its own weight, and bears transportation very badly. The use of such woods is, however, partially justified by the fact that the coke for the lead furnaces costs in this locality $45 per ton. Thirty-five cords of wood make 1,000 to 1,200 bushels, of 2,680 cubic inches each, of charcoal, or about 45 bushels to the cord. In 1875 the contract was made to deliver at American Fork at 18 cents a bushel.

It seems to be very generally conceded in the Eastern States that the conical kilns holding from 25 to 35 cords are the most profitable. They are less expensive in construction, more easily filled, cheaper to manage, give a better yield, and can be turned more frequently than any of the other varieties of kilns.

Statistics of Conical Furnaces.

Diameter or length, inside in the bottom	28	feet.
Height to spring of arch	19½	feet.
Capacity in cords	35	
Number of thousand brick	33	
Number of vents	94	
Weight of cast iron vent-holes, each	14	lbs.
Pounds of cast iron	3,000	
Pounds of wrought iron	1,000	

A man remains about the kiln all the time.

	Charging.			Burning.			Cooling.	Discharging.			Per Cent of Brands.
	Time.	Days' Work.	Horses.	Time.	Days' Work.	Horses.	Time.	Time.	Days' Work.	Horses.	
	Days of 10 hrs.	Men.		24 hrs. 4 days and nights.			Days of 24 hrs.	Days of 10 hrs.	Men.		
1	1	6	1	1	0	0	3	1	4	2	5

Cost per hundred bushels	$0 85
Foundation 50 P. of stone, 3 to 4 feet are required, costs	100 00
Bricks $5.50 per M., laying in wall $4.50 per M.	320 00
Cast iron for frames, vent-holes, etc., 1 ton	75 00
Total cost of furnace	$495 85

At Plattsburg, in 1879, it cost $7.50, on Lake George $7, and in a few localities in Vermont $6 per thousand bushels to fill, burn, and empty; the average will be from 6 to 7 cents.

The per cent of brands in a well-burned kiln will be from one cord in 17.5 cords to one in 18.5. It takes for a 50-cord kiln 12 days, for a 35-cord kiln 9 days. The charging requires 1 day for 4 men for 35 cords, and 1 day for 5 and 6 men for 50 cords. Two horses are used for the 35-cord kiln at Plattsburg, but the whole work is done by men with wood barrows.

	50 cords.	35 cords.
Days charging	1	1
Men employed charging	5 to 6	4
Horses used	barrows	2
Number of days burning	10	6 to 7
No. of men employed burning	1	1
No. of days discharging	1	1
No. of men discharging	3 to 4	2
No. of horses	2	2
Yield of wood in bushels	50	50
No. of bushels of charcoal to cord wood	50	
Weight of bushel	20 lbs.	(soft, 11 to 14 (hard, 15 to 19

The cost of these kilns will vary with the locality, depending on the local cost of the materials used. It will cost about $500 to build a conical kiln, of from 35 to 50 cords, in Plattsburg, and about $600 in Michigan, with brick at $17.50 per thousand. There seems to be no doubt that the Plattsburg kiln, with iron vent holes, is the best type of all the kilns.

SMELTING FURNACES.—A contract has been concluded with the Arizona Copper Company, owners of the Clifton and Longfellow mines, for three of the Fraser & Chalmers improved 42-inch water-jacket furnaces for treating copper ore. The entire order is for about 200 tons of machinery, and includes an automatic engine of 110 horse-power, one of 35 horse-power, one of 25 horse-power, two steel boilers 60 inches by 15 feet, three Leffel water-wheels, for use when water is plenty, a No. 6 Comet crusher, two large sized Blake crushers, 186 sets of ore-gates for ore bins, three No. 6 Baker blowers, and all accompanying machinery. Messrs. Fraser & Chalmers have also received an order from the District Copper Company, of Clifton, Arizona, for one of their copper furnaces, and have recently shipped the Concordia Smelting Company, Mexico, a complete copper plant. The same firm has also an order in hand from the Benson M. and S. Company for a 60-ton oblong galena furnace, similar to the one previously furnished by them.

OLD miners who formerly operated in Stockton, Ophir and Dry Canyon, Utah, are returning to these camps to again try their luck. Development work done in the past six months convinces them that there is a bright future before the districts which once produced so much ore.

C. H. AARON, one of the oldest and best assayers and metallurgists in the west, has come to Prescott to work and make it his home. His assaying rooms are in rear of Huhhard's cigar store, Montezuma st.—*Prescott, Ariz., Courier.*

CONSIDERABLE outside capital will be invested in Utah mines this winter.

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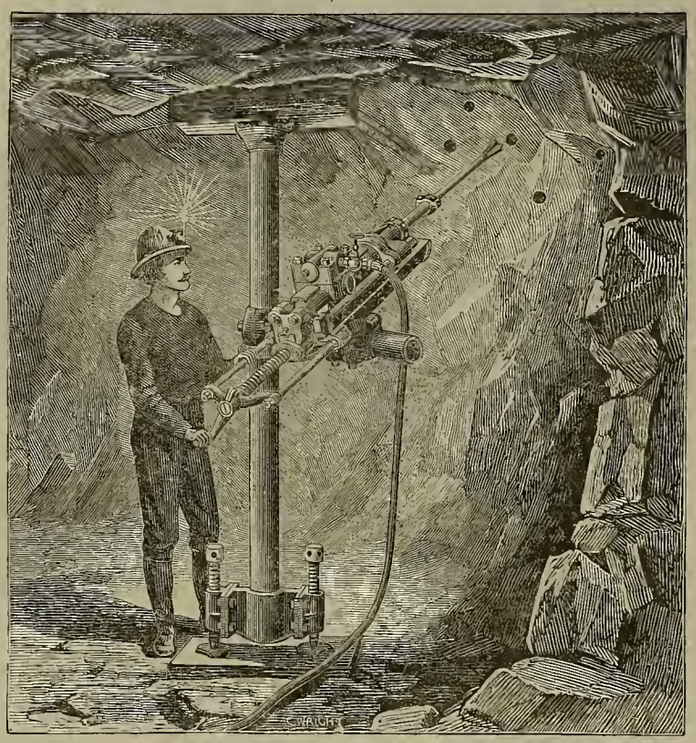
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Rand, improved, 3½"	1.041	" "
Ingersoll, D2 3", beat Rand 3½"	.744	" "
Ingersoll, D2 3", beat National 3½"	.505	" "
Ingersoll, E 3½", beat Rand 3½"	.560	" "
Ingersoll, E 3½", beat National 3½"	.321	" "
National beat Rand	.139	" "

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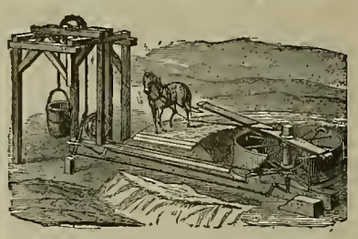
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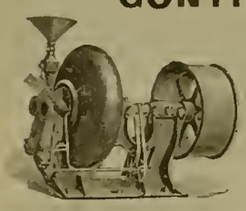
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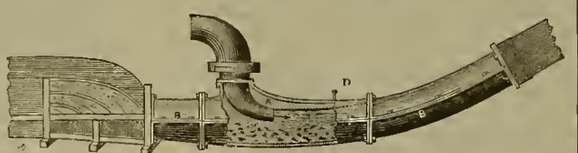
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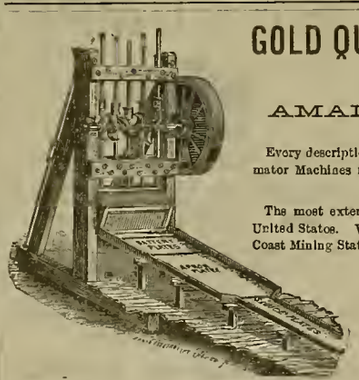
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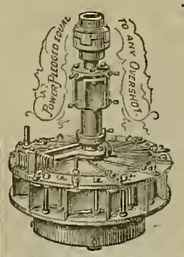
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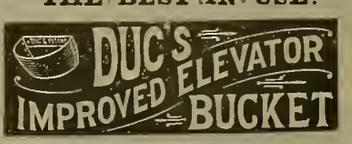
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Disposal of Tailings.

The Case of the Spring Valley Mining Company.

In the PRESS recently we gave briefly the decision of Judge Keyser, of the Superior Court of Butte County, in the case of Allen S. Noyes vs. Spring Valley Hydraulic Gold Mining Company. Many persons thought this decision had a direct bearing on the debris question, but it had not. In fact, the Spring Valley Company, who have paid large sums to the Miners' Association, asked that association to take up the defense of the case. The association, however, refused, on the ground that the question was a local one, not bearing on the general "debris" proposition at all. Some of the editorial comments of the papers in this state show that the facts are by no means well understood. In conversation this week with the Superintendent of the mine, we have learned many points which will be of interest to the mining community:

The nominal plaintiff in the case is Allen S. Noyes, but the real plaintiff is Wm. H. Parks, of Marysville, late speaker of the House. Parks and Noyes own all of the swamp and overflowed land in the sink of Butte Creek, east of the creek, aggregating about 500 acres.

This land forms the natural sink of Butte Creek, and was, we are told, purchased from the state as swamp and overflowed land for the sum of fifty cents an acre. The sink of Butte Creek is a tule swamp, which has never been nor can be cultivated. The land lies only a short distance from the Sacramento River, with which it is connected by means of the Butte Slough. As soon as the Sacramento River commences to rise a portion of it runs out through this slough and fills the basin called the sink of Butte Creek, and floods all the land owned by Parks & Noyes. During high water this land has been flooded to a depth of sixteen feet, and every year the land is under water to a depth of several feet, which remains on the land, or on a large part of it, until the month of July. During the past summer the land was entirely dry. It produces a rush grass of little value for grazing or for hay.

The old Spring Valley Company allowed the water from the mine to flow down to and upon this land during the summer or dry season. As soon as the present company was informed in regard to the flow of water on this land, it immediately took measures to prevent any further damage (if it can be called a damage, to flow water taken from Butte Creek back into the sink of Butte Creek) to Noyes & Parks' land.

The testimony as to the deposit of slickens was entirely in favor of the mining company, which produced in court samples of both the deposit on the land and the water standing on it. Neither of these samples showed any slickens or tailings from the mine—the Spring Valley mine.

This mine is situated at Cherokee, Butte County, and has been worked since the early days of California. It is elevated about 1,000 feet above the Sacramento Valley, and is distant about 40 miles from Parks & Noyes' land. In the year 1872, a large supply of water was brought to the mines by means of ditches, flumes, and iron pipes, at a cost of several hundred thousand dollars. The sources of supply are Butte Creek, 1,800 miners' inches, and west branch of Feather River, about 400 inches. This amount of water, to wit, 2,200 inches, is led to the mine through a thirty-inch iron pipe. The pipe can not carry more than the above amount, so there can have been no increase of water during the past eleven years. The debris from the mine is run into Sawmill Ravine, which empties into Dry Creek. Dry Creek ran across the Sacramento Valley. During the summer time it was dry, and during the winter its waters emptied into the sink of Butte Creek.

By the constant use of this large supply of water, the debris from the mines began to fill the ravines, and soon flowed down and filled a part of Dry Creek. The owners of the mine, finding that the debris was fast threatening destruction to agricultural lands, commenced the purchase of these lands, and expended more than half a million dollars in these purchases and in the construction of a canal. This canal commences about eight miles below the mine, and extends across the valley for a distance of more than 20 miles. It is a half mile wide in places, and at no point is less than 400 feet. It is constructed with two levees on each side. The side levees are about 30 feet apart. The space between the side levees is being constantly filled up and the banks raised by causing the sediment to be deposited by means of cross dams which retard the flow. The heavy material is deposited near the mine. The fine gravel and sand flow down and are deposited in the bed of Dry Creek, upon lands owned by the company. At a point about 6 miles below the mine a substantially built brush dam (not one of Parks' Yuba dams) has been constructed. By means of this dam not only all the sand and heavy material but also a large amount of the so-called slickens are caught and retained. Nothing but the very lightest material which is held in suspension is allowed to flow into the canal. This sediment is being continually deposited in the side channels, until it reaches a point near the lower end of the canal, where by means of a dam it is turned out into Keppel Lake, covering about 200 acres. The water being brought into this lake on one side and taken out on the other is freed from all earthy matter. From this lake the water (clear enough to drink) is turned into Butte Creek, the same stream from which nearly all the water was taken to the mine. This is a fair and truthful statement of the case for the greater part of the year.

Let the facts for the balance of the year be presented. The canal above mentioned was constructed of sufficient size to carry the water of all the streams which drain the land lying between the water-sheds of Butte Creek and Feather River. During a heavy storm the canal carries from fifty to one hundred times as much water as is used at the mine. During the winter there is a large flow of natural drainage water through the canal. This water would naturally have flowed down Dry Creek, the terminus of the canal being in the bed of Dry Creek. The water is now discharged at the same point it would have been discharged had no canal been constructed.

It is impossible during heavy storms to turn so large a body of water out of the canal and into the lakes. It is therefore allowed to flow out through the end of the canal. From the end of the canal down to Parks & Noyes' land the distance is six miles. The mining companies own a continuous body of land comprising about 4,000 acres between the end of the canal and Parks' land. This land is covered with tules, rushes, willows and grass, so that the water from the canal is filtered and all sediment is deposited before it reaches Parks & Noyes' land or lake, for at such times as the water is allowed to escape through the lower end of the canal the land owned by Parks & Noyes is entirely covered with water. This lake at times reaches up to the terminus of the canal. It can not be claimed that the land is damaged by water, when it is already flooded to a depth of several feet. Besides, the amount of foreign water used at the mine is only 400 inches, the balance being from Butte Creek, and would flow into this lake if not used by the miners.

Such are the facts as they were brought out before Judge Keyser. Such are the facts as they really exist. Can any fair-minded man say that the mining company did not have good reasons for defending this suit and good reasons for expecting a fair decision on the facts? The mining company in this case does not claim the right to flow water or debris on agricultural or grazing land. All that is claimed is to use the waters of Butte and other creeks and turn the same, free from sediment, into Butte Creek or into the sink of Butte Creek when the same becomes a lake. This is the right which Judge Keyser has denied by injunction.

Miners generally have little hope of winning a suit in Sutter County. Judge Keyser found "that now more than half of plaintiff's land is kept continually covered by water, etc., from defendant's levee;" yet we are told the Judge, when he previously visited the land, found it entirely free from water. He found, also, "the water when it leaves the lake near the end of the canal still laden with sand, sediment and light matter," though when he visited the lake with several gentlemen representing both sides, he is said to have drank of the water after it flowed from the lake. The findings also show that a part of the water, after passing through Keppel's Lake, still flows into Dry Creek and down on plaintiff's land; yet when the Judge visited the tract he found in crossing Dry Creek that it was dry in name and fact. The Court also considered that the canal was not necessary to the working of the mine, and evidently did not consider the only testimony on this point, which was sworn to by several witnesses for the defendant, to the effect that the issues could not run unless permitted to run through the canal.

In conclusion, it may be stated, that as the Spring Valley Company is not able to continue the purchase of lands until it owns the whole of the Sacramento Valley, or that portion of it lying south of its canal, it may be compelled to cease mining for a part of the year, until it can perfect another system of disposing of its tail water.

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Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

DELINQUENT SALE NOTICE.

Seaton Gold Mining Company.—Location of principal place of business, San Francisco, Cal.; location of works, Drytown, Amador county, Cal.

NOTICE.—There is delinquent upon the following described stock, on account of assessment (No. 4) levied on the 27th day of September, 1883, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Martin, A, Trustee	34	5,000	$500 00
Martin, A, Trustee	35	5,000	500 00
Martin, A, Trustee	38	5,000	500 00
Martin, A, Trustee	42	5,000	500 00
Martin, A, Trustee	43	10,000	1,000 00
Martin, A, Trustee	48	2,900	290 00

And in accordance with law, and an order of the Board of Directors, made on the 27th day of September, 1883, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, No. 224 California Street, San Francisco, Cal., on MONDAY, the 19th day of November, 1883, at the hour of 1:30 o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

CHAS. T. BRIDGE, Secretary.

OFFICE—224 California St., San Francisco, Cal.

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OFFICE OF THE

Standard Consolidated Mining Company.

San Francisco, November 2, 1883.

At a meeting of the Board of Directors of the above named company held this day, Dividend No. 60, of twenty five cents (25c.) per share, was declared, payable MONDAY, November 12, 1883, at the office in this city, or at the Farmers' Loan and Trust Company, in New York.

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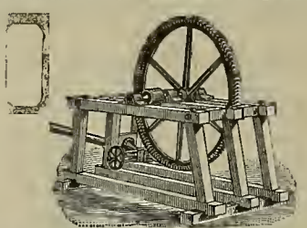
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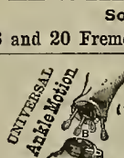
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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING OCTOBER 30, 1883.

287,508.—CENTRIFUGAL PUMP—N. Didiot, Bakersfield, Cal.
287,426.—SPOOL OR BOBBIN—C. Elkan, S. F.
287,053.—ORE PULVERIZER—A. L. Fish, S. F.
287,536.—GANG PLOW—T. L. Grigsly, Yountville, Cal.
287,546.—ORE CONCENTRATOR—F. M. Johnson, Gardiner, Oregon.
287,550.—FIFTH WHEEL FOR VEHICLES—John S. Klapperich, S. F.
287,580.—PLUMMET LAMP—John Roach, S. F.
287,177.—VENTILATOR—Wm. Schmolz, S. F.
287,479.—ROTARY HARROW AND CLOD BREAKER—Budd Smith, S. F.
287,738.—CAR REPLACER—Wm. Toombs, Logan, U. T.
287,662.—COMPOSITION FOR AGUE—Thos. A. Wilson, Lodi, Cal.

FOR WEEK ENDING NOVEMBER 6, 1883.

287,989.—VELOCIPEDE—W. F., J. P. & I. G. Ahlert, S. F.
287,996—MOLDING MACHINE FOR FOUNDRY USE—Frank Bardez, S. F.
287,798.—BUCKLE—Ole P. Borg, Richfield, U. T.
288,026—SADDLE—M. Comstock, Los Angeles.
287,908.—BUNG BOTTLE—S. P. Connor, St. Helena, Cal.
287,925.—THRASHING MACHINE AND SEPARATOR—Samuel Hamilton, Salinas, Cal.
287,934.—CAR COUPLING—E. M. Hobbs, Santa Rosa, Cal.
287,941.—HYDRAULIC PORTLAND CEMENT—Wm. Jones, S. F.
288,179.—DOOR SECURER—C. Leaming, Newhall, Cal.
288,180.—GRIP FOR CABLE R. R.—A. H. Lighthall, S. F.
288,088.—GATE—Wm. Mason, Puyallup, W. T.
287,950.—MOTOR FOR OPERATING PUMPS—H. Melde, S. F.
288,104.—ANIMAL SHEARS—Jas. H. Orr, Ukiah, Cal.
288,124.—FRUIT DRIER—Wm. Schmolz, S. F.
288,133.—VALVE GEAR FOR STEAM ENGINES—A. J. Stevens, Sacramento.
287,984.—LAWN SPRINKLER—R. M. Widney, Los Angeles, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific Coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Ageney, the following are worthy of special mention:

CAISSON GATE.—George F. Schild, Vallejo, Cal. No. 287,178. Dated, Oct. 23, 1883. This is an improved caisson or floating gate for harbors, canals, river locks, deep-water basins, and the different kinds of drydocks. It consists in a gate formed of a plate shaped like and adapted to fit the entrance of locks, harbors, or docks, on a peculiar boat-like structure or buoy, connected with it, to keep it afloat and upright, and in means for sinking or floating said gate and buoy, consisting of certain water tanks and peculiar valves. The gates which are ordinarily used consist of two leaves swinging on parts below, and in straps above water. A great amount of mechanieal foree is necessary to operate them, causing much wear. Repairs are eostly. The caisson gates which are generally used are boat-like, floatiug structures, the keel and stems of which fit into grooves at the entrance of harhors or docks, and prevent the water flowing out or in. These caisson gates are very heavy. The object of this invention is to provide a floating gate or caisson gate which will be light and easily handled, requiring no stationary ballast to lower it and keep it steady, and no pumps to raise it.

THRASHING MACHINE AND SEPARATOR.—Samuel Hamilton, Salinas, Monterey Co. No. 287,925. Dated Nov. 6, 1883. It is a fact well known to those familiar with the art that the eylinder of a thrashing machine is capable of thrashing two or three times as much grain as the cleaning-shoe can separate and clean, and if the thrashing cylinder is fed up to its capacity or forced, the mass of straw becomes so great that, in addition to the grain which goes to the shoe not being properly cleaned, much is so entangled with the straw that it is never separated or gets to the shoe at all, but is lost by being carried out at the tail end with the straw. Mr. Hamilton's invention relates to certain improvements in these machines, and it consists of a duplex arrangement whereby the straw and waste from the straw-carrier and cleaning-shoe respectively are conveyed through a second and similar apparatus, the two being continuous and automatic.

HYDRAULIC PORTLAND CEMENT.—William Jones, S. F. No. 287,941. Dated Nov. 6, 1883. This invention relates to a new and useful process of manufacturing or forming what is known as hydraulic Portland cement, and it consists in the treatment of argillaceous limestone or dolomite containing an excessive quantity of clay (silicate of alumina), with lime or its carbonate, and in subsequent steps. Heretofore Portland cement has usually been made by an artificial mixture of lime and clay. In argillaceous limestone or dolomite there occurs this mixture naturally; but seldom are the proportions requisite for the manufacture of the cement. More frequently there is too small a quantity of lime and an excess of clay. Consequently, such argillaceous limestone or dolomite is worthless for making the cement. The object of this process is to utilize such limestone or dolomite by adding thereto the requisite amount of lime.

INCUBATOR.—Chas. F. Winkler, Bakersfield, Cal. No. 286,756. Dated Oct. 16, 1883. This invention relates to certain new and useful improvements in that class of incubators employing an endless traveling conveyor for receiving and advancing the eggs. The object is to overcome certain difficulties now existing in this class of machines. It is so constructed as to allow the introduction of a fresh lot of eggs at short intervals, and gives to each lot its own required temperature. The machine hatches the eggs in small batches, removed from the unhatched eggs, so the temperature is not lowered in removing them, nor are they injured. The machine provides for the different temperatures necessary to hatch out all kinds of eggs—goose, duck, turkey and chicken, giving each its required time and temperature.

LOOM FOR WEAVING BAGS.—John Laird, Jr., Forfar, Scotland, assignor to Wm. Rutherford, S. F. No. 286,711. Dated October 16, 1883. The invention has special reference to looms for weaving fabrics in which the eloth has at definite intervals or spaces to be woven into rough cloth for the purpose of forming the bottoms or sides of such bags, sacks or similar articles, according as the said artieles are woven with their length lying longitudinally or transversely with the web or warp of the cloth. The object is more especially to render the whole of the operation in connection with the weaving of such goods or fabrics, and especially the bottoming and weaving operations, automatic.

IF YOU want a lubricant that will run any thing cool write CHARLES J. WOODBURY, GENERAL MANAGER LUBRICATING DEPARTMENT CONTINENTAL OIL AND TRANS. Co., for "Lubrice." It is the best compound-grease in the market. Shipped in 5, 10 and 25-pound cans, half barrels and barrels. Warranted to give satisfaction. Observe the numbers: No. 2 is soft for outside work; No 3 is medium soft; No. 4 is medium hard; No. 5 is very hard, where unusual lubrication is demanded. Send for Catalogue of Lubricating Oils.

San Francisco Metal Market.

[WHOLESALE.
THURSDAY, Nov. 15, 1883.

ANTIMONY—Per pound	14	@	15
IRON—American Pig, soft, ton	30 00	@	—
Scotch Pig, ton	26 00	@27	50
American White Pig, ton	—	@	—
Oregon Pig, ton	—	@	—
Clipper Gap, Nos. 1 to 4	32 50	@35	00
Refined Bar	4	@	—
Horseshoes, keg	5 50	@	—
Nail Rod	7½	@	—
Norway, according to thickness	6½	@	7
STEEL—English Cast, lb	16	@	25
Black Diamond, ordinary sizes	14	@	—
Drill	15	@	16
Machinery	12	@	14
COPPER—Ingot	22	@	—
Sheet	31	@	35
Sheeting, 3 inted, 14x18	22	@	23½
Nails	17	@	—
Bolt	31	@	—
Old	8	@	—
Bar	—	@	—
Cement, 100 lbs	15½	@	—
LEAD—Pig	4½	@	4
Bar	6	@	—
Pipe	7	@	—
Sheet	8	@	—
Shot, discount 10% on 500 bags: Drop, ₱ bag	2 10	@	—
Buck, ₱ bag	2 30	@	—
Chilled, do	2 50	@	—
TIN PLATES—Charcoal	7 55	@	—
Coke	5 50	@	5 75
Banca Tin	25 00	@	—
Australian	25 00	@	—
I. C. Charcoal Roofing, 14x20	6 50	@	6 80
ZINC—By the cask	19	@	—
Sheet, 7x3 ft, 7 to 10 lbs, less the cask	90	@	—
NAILS—Assorted sizes	3 30	@	4 75
QUICKSILVER—By the flask	—	@	—
Flasks, new	1 05	@	—
Flasks, old	85	@	—

Lumber.

WEDNESDAY, Nov. 15, 1883.

REDWOOD. CARGOES			
Rough	18 00	@	—
Surfaced	24 00	@28	00
Floor and step	22 00	@28	00
RETAIL.			
Merchantable	22 50	@	—
Surfaced, No. 1	37 50	@	—
Tongue&grooved	30 00	@37	50
Pickets: rough	20 00	@	—
do fancy	30 00	@	—
do square	17 50	@	—

Shingles	2 50	@	—
Posts, each	15	@	17½
PINE. CARGOES.			
Rough	8 00	@	9 00
Surfaced	27 00	@28	00
RETAIL.			
Rough	22 50	@	—
Flooring	32 50	@35	00
Floor and step	35 00	@37	—
Lath	3 75	@	50

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J. W. A. WRIGHT—Merced and Tulare counties.
JARED C. HOAG—California.
B. W. CROWELL—Colorado, Utah and Montana.
M. H. JOSEPH—Eureka, Nev.
I. M. LEHIY—San Bernardino and San Diego counties.
J. J. BARTELL—Santa Clara county
C. E. CURTIS—Kern and Inyo counties.
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A. C. KNOX—Butte and Sutter counties.

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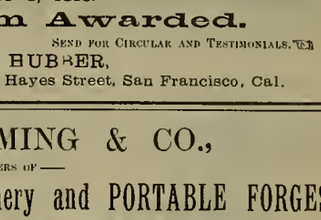
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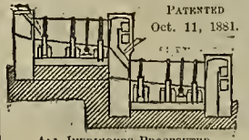
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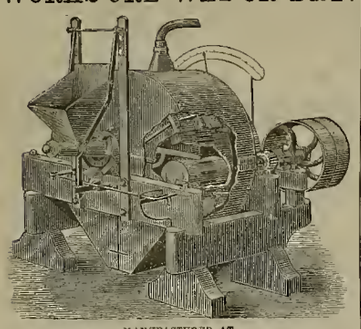
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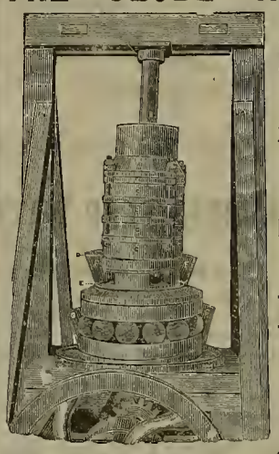
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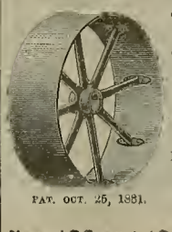
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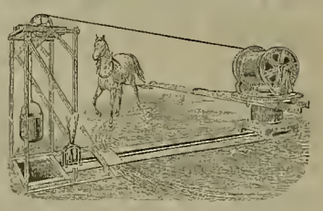
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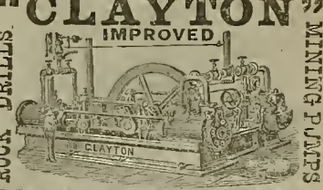
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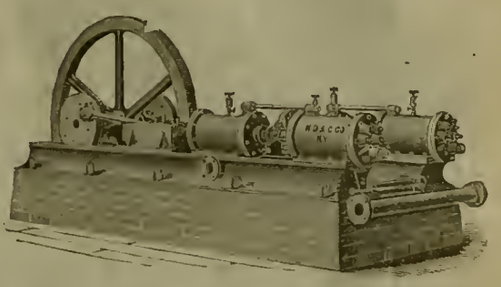
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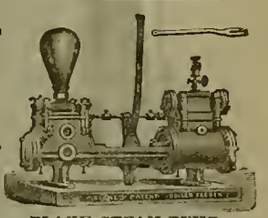


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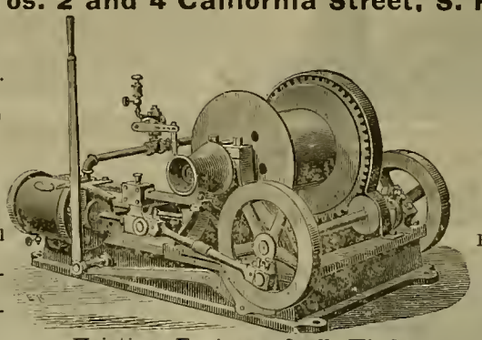


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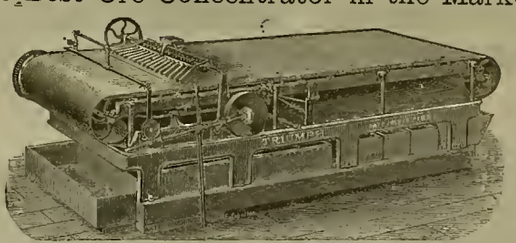
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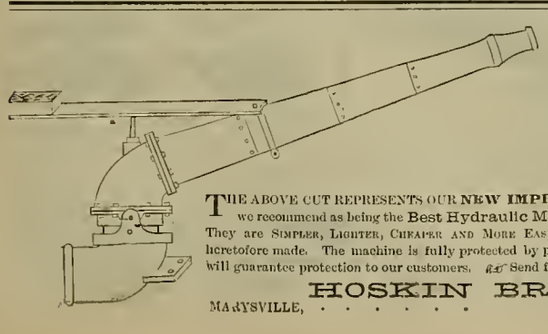
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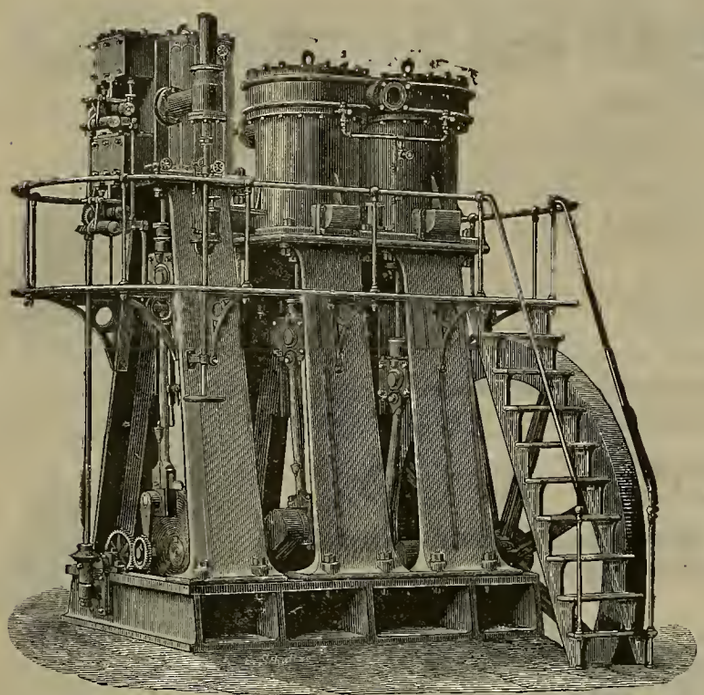
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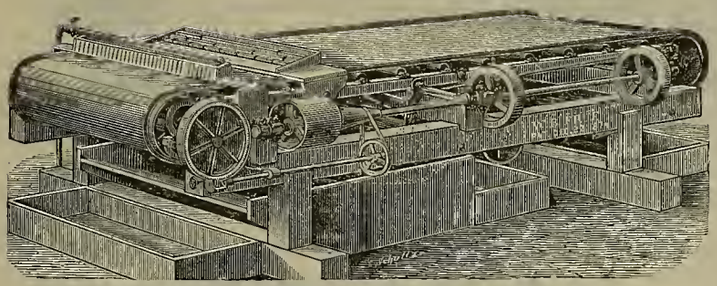
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That legal advice has been given that *all shaking motion* applied to an *endless traveling* belt used for concentration of ores is an infringement on patents held and owned by the Frue Vanning Machine Company

That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.

That the patent laws make *users* of infringements responsible as well as makers, and the public is therefore warned that there is considerable risk in purchasing any end-shake machine until our various patents have been decided.

That if there are those who for any reason prefer an end-shake machine, we can manufacture and sell to such machine of that description, as efficient as the Triumph, and at a lower price, and no liability for infringement will then be incurred by the purchaser.

That we shall protect ourselves against any one making, selling or using any machine infringing any of our patents. Patented July 9, 1867; May 4, 1869; Dec. 22, 1874; Sept. 2, 1879; April 27, 1880. Patents applied for.

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ADAMS & CARTER, Agents Frue Vanning Machine Company,

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Nov. 6, 1882.

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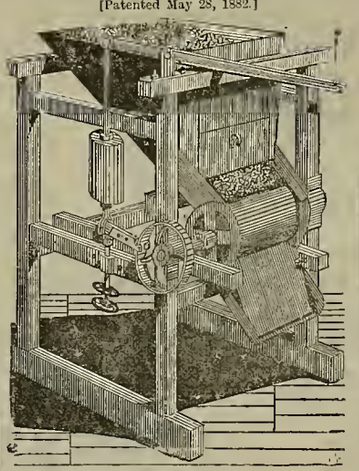
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[Patented May 28, 1882.]



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It has fewer parts, requires less power, is simpler in adjustment than any other. Feeds coarse ore or soft clay alike uniformly, under one or all the stamps in a battery, as required.

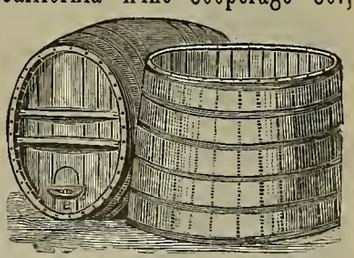
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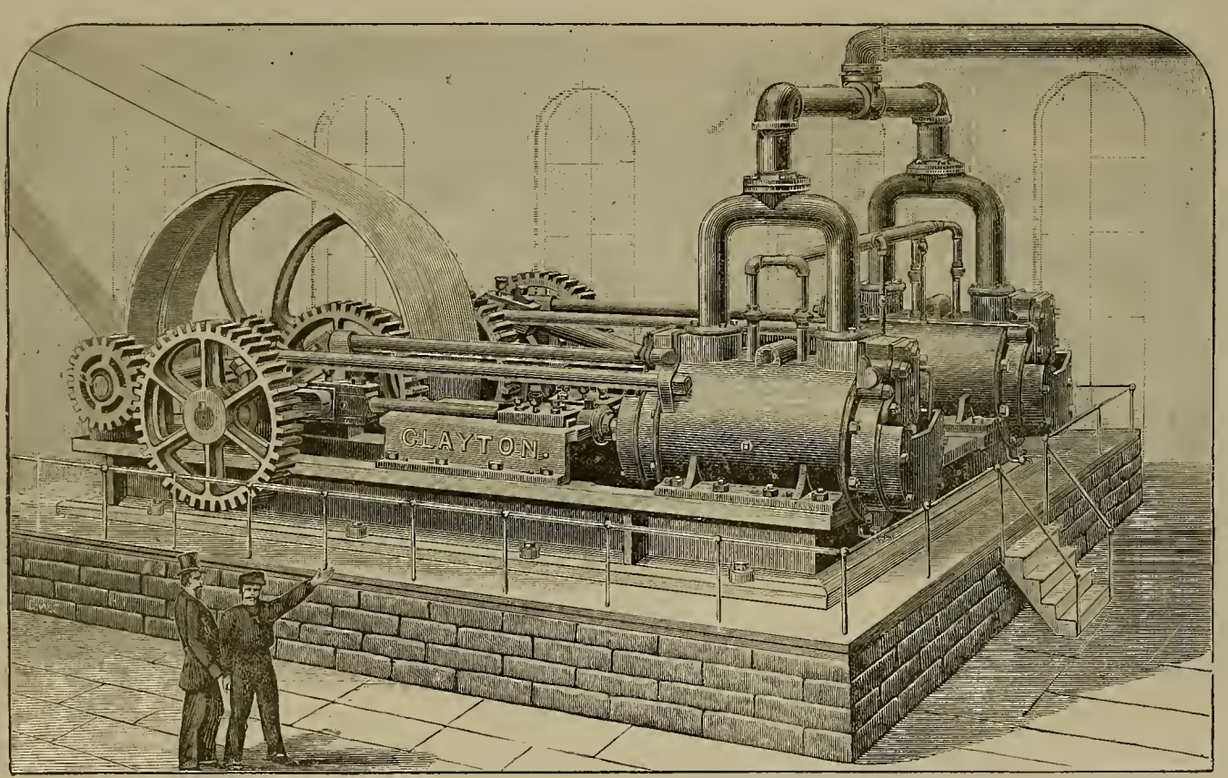
SAN FRANCISCO, SATURDAY, NOVEMBER 24, 1883.

VOLUME XLVII
Number 21.

The Clayton Improved Air-Compressors.

Our illustration this week shows the "Clayton Improved Duplex and Double-Acting Belt Air-Compressor," with pipe and belt connections, etc., as in actual work.

These compressors are extensively used in working rock-drills, coal-cutting machines, underground pumping, etc., and are made to supply a demand where compressed air at a pressure of 50 to 200 pounds is required. These compressors are geared on crank shafts so as to give an even strain on cranks. The cranks are made of the best wrought iron, and are placed at right angles; the connecting rods are of improved pattern, the cross-heads have composition gibs, and work on slides of wide wearing surface; the pistons are metallic, with a series of rings made of the best composition or phosphor-bronze, and will last a long time and remain perfectly air-tight.



THE CLAYTON AIR COMPRESSOR.

These compressors are driven by a heavy pulley, which acts also as a fly-wheel, and gives a steady motion, and the entire machines are built very strong.

The cylinders are encircled by water jackets of recent design; the water is received into the jackets through pipes, which may be seen in pairs connected with the top of the cylinders near the center, such partitions being placed in the jackets as force the water to circulate from the center along the top to and around the ends of the cylinders for one-fourth of their length, at which points the greatest compression of the air takes place, and consequently the most heat is generated, and then passes around the center of the cylinders, discharging at the top, thus equalizing the temperature of the middle of the cylinder to the same degree as the ends and top. Thus, the water-jackets can never be without water, as they could be if the water was discharged from the bottom.

Notice is especially called to the fact that in these compressors there are no sliding valves, rotary valves or so-called positive moving valves, for the admission of the air, as it is claimed that such valves produce much friction and wear, and can be kept tight only a short time. The induction and eduction valves are both placed in the cylinder heads, and are so arranged that the valves and seating can be unscrewed and removed by taking off the covers. Disks of a semi-elastic material are interposed between the valve faces and seats, which protect the metal surfaces from wear, besides being quickly and cheaply replaced when worn.

The suction valves which form a most important part in a good air-compressor are of the poppet style, having flat faces and a slightly elastic disk between valve and seat, which disk takes all the pressure and protects the metal surfaces against wear, and keeps the valves tight, they being subjected to no sliding or rubbing motion.

The suction valves are very numerous, and give plenty of opening for air admission until the cylinders are filled to almost the atmospheric pressure; they are placed in the air-cylinder heads, which experience has shown is the proper place for the inlet valves, and all danger of their falling into the cylinders through the stems breaking or the nuts coming off the stems is now overcome by the introduction of the "patent safety stems" or bolts, which effectually secure the valves from falling into the cylinders, and enable the engineer to put the nut on again without taking off the head; or should the valve-stem break, the valve may be fastened against the seat until it is convenient to repair it.

The following partial list of the mines and improvements which are using the Clayton Air-Compressors shows the popularity in which these machines has attained, viz.: Northern Pacific railroad; Bismark, Dakota; Portland, Oregon; Ainsworth, Washington Territory; Hudson River tunnel, New York and New Jersey; Callao mine, South America; Monte Cristo gold mine, California; Highland Mary mine, Colorado; Moose River Gold Mining Co., Nova Scotia; Silver Peak M. & S. Co., Colorado; Sullivan Mining Co., Maine; American Emma Mining Co., Utah; Equitable Silver Mining Co., Colorado; Equator Mining Co., Colorado; Lebanon Mining Co., Colorado; Mass. and New Mexico Mining Co., N. M.; South Barcelona mine, Nevada; Bonanza and Union Tunnel and Mining Co., Colorado; Rossie Iron Works, Bay State Iron Co. and Chateaugay Ore & Iron Co., New York; Hecla Iron and Mining Co., Ohio; Albion Mining and Milling Co., Michigan; Breece Iron Mining Co., Colorado; Green Pond Iron mines, N. J.; Musconetcong Iron Works, N. J.; Hastings Iron Co., Ontario; Morris Run Coal Mining Co., Morris Run, Pa.; (This is an eighteen-inch diameter by twenty-four-inch stroke duplex air-compressor, and is employed in running the Harrison coal-cutting machines, two flywheel water pumps and a hoisting engine in the mines); Burlingame and Scranton Coal Mining Co., Kansas; Trinidad Coal and Coking Co., New Mexico; Osceola Copper Mining Co., Michigan; New Almaden Quicksilver Mining Co., California; Bergen Post Zinc Mines, Pa.; Missouri Valley and Blair Railway and Bridge Co., Iowa; U. S. Government Works, Flood Rock, N. Y. Harbor (who are using a Clayton Duplex Air-Compressor for supplying air to the divers engaged on the work); Bradford Gas Light and Heating Co., Bradford, Pa. (who are using three No. 4 and one No. 9 Clayton Duplex Air-Compressors, which compress the gas at the natural wells at Rixford and force it a distance of thirteen miles, heating and lightning the city of Bradford); Jamaica Government railways (Parus and Ewarton extensions), West Indies; etc., etc.

The new building for the Clayton Steam-Pump Works, which is one of the largest and most substantial buildings in that section of Brooklyn, was completed in May of the present year, and is located near the approach to the New York and Brooklyn Bridge; the large wire sign on the roof, "Clayton Air-Compressors," being distinctly visible the entire length of the bridge. It requires but ten minutes from the City Hall, New York, to reach these Works via. the Bridge Cable railway, now running.

The works are equipped with improved machinery and they propose to build and keep in stock, ready for prompt delivery, a full line of the Clayton Improved Air Compressors, of capacity to run from one to fifty drills.

Copies of their new catalogue, October, 1883, estimates and general information, will be furnished on application to the Clayton Steam-Pump Works, 45 and 47 York Street, Brooklyn, N. Y.

The Pennsylvania railroad is now building a gigantic inclined plane at Pittsburgh, up which teams and freight and passenger cars will be hauled by means of steel cables, now being made by the Hazard Manufacturing Company, of Wilkesbarre. The plane has a total length of 840 feet, the rise being nearly 43 feet in the hundred. It is built on arches. The longest span is 232 feet, another one is 120 feet, and the rest 60 feet each. The cables to be used in hauling up cars are entirely of steel, and will be the largest steel cables ever made in this country. The engines which will furnish the motive power are nearly completed, and will be of 700 indicated horse-power. The total cost of the gigantic structure, complete, will be $275,000.

CORRESPONDENCE.

Recollections of California Mining Life.*

Men and Events in the Pioneer Days -No. 3.

[Prepared for the MINING AND SCIENTIFIC PRESS, by HENRY DEGROOT.]

General Sutter's Account of the Gold Find.

Before going on to further notice the changed condition of things produced by the discovery of gold in California, it may not be out of place to say a few words touching the accounts of that occurrence as given by different parties who had some agency in bringing it about or were in a position to speak authoritatively on the subject. General Sutter's version of the affair, as imparted by him to the writer, varies but little from that of Marshall, as already recounted. According to General Sutter's statement, Marshall, leaving the mill sometime near the end of January, 1848, came down to the fort, where he arrived towards evening wet, and covered with mud, the day having been stormy. His visit was unexpected, as he had been to the fort not long before. After talking a little about other matters he told his employer or partner—Marshall always claiming to have been interested with Sutter in the saw-mill business—that he had some important information to impart to him, so much so that he wished to see him apart and where no one could see or overhear them. Complying with his request Sutter took him into his private room, but having neglected to lock the door, a clerk entered just as Marshall, plucking a rag from his pocket was about to exhibit its contents. Alarmed at the interruption, he quickly replaced the package, and when the intruder left insisted on having the door to the apartment locked. This done, he again pulled out the package, and undoing a much soiled rag, exhibited two or three ounces of yellow metal, which he informed his employer he believed to be gold. Sutter was of the same opinion, and after reading a description of that metal in an encyclopedia which he happened to have at hand, proceeded to experiment on the dubious material with nitric acid, whereupon he found it to be unmistakably gold. So much was Marshall excited over the matter that he declined to remain at the fort over night, but left at a late hour and in a heavy rain to return to the mill, after exacting from Sutter a promise that the latter would follow him in the morning, which he did.

General Sutter relates that, despite the storm, which still continued, he started at an early hour the next day for the mill. While on his way, and when out about twenty miles, he saw to his surprise a man come out of the chaparral a short distance ahead of him. Riding up to the spot, he found this to be Marshall, who had already since leaving the fort been to the mill, and, there procuring a fresh horse, had returned thus far, when, overcome with fatigue and loss of sleep, he made a halt, crawled into the bushes and took a nap. When Sutter came up, having so refreshed himself and rested his animal, he had already gotten into the saddle and was about resuming his journey towards the fort. When interrogated as to his object in returning so soon, nothing very definite could be gotten out of him; the pretense that he had come on to meet the General and see that he did not miss the trail being evidently no part of his real purpose, as Sutter had already been over the road, which, being well marked by wagon travel, could not easily be missed. The truth was, that Marshall had become so excited when it was shown that the stuff he had picked up in the mill-race was really gold that he could neither sleep nor rest until he had his partner on the ground and something as to their future course of action had been determined upon. Hence this speedy setting out again for the fort, the poor man, in his anxiety, fearing that Sutter, an easy-going sort of person, might delay his coming, or, not fully appreciating the importance of the occasion, might fail to come altogether. This frame of mind on the part of Marshall sufficiently refutes the idea entertained by some that he was long in doubt as to the character of the metal he had found, and little conscious of the consequences likely to grow out of that event. He was not long in taking measures to confirm, what from the first he suspected, that the metal was gold, nor did he fail to comprehend the results that might be expected soon to follow.

On reaching the mill Sutter entered the race with Marshall, and walking down it picked up with his own hand several particles of gold. Adding these to some other pieces given him at the time by the workmen, he had a ring manufactured therefrom, on the inside of which was engraved the following inscription: "The first gold discovered in January, 1848."

The First Piece of Metal Picked up by Marshall, and Mrs. Wimmer's Version of the Gold-Find.

While the sentence as above inscribed was in some sense true, this ring of General Sutter did not actually contain the first piece of gold picked up by Marshall, though that is still in existence, and capable of being identified by many persons who at different times have seen and handled it. Owing to its size, shape and other peculiarities, persons who have once seen this piece of gold have no difficulty in recognizing it when shown to them again. It is rather flat, rough on all sides, of irregular shape and weighs about a quarter of an ounce, its intrinsic value being not quite five dollars.

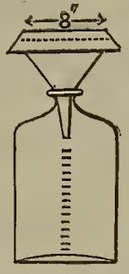
Mrs. Jane Wimmer, wife of Peter Wimmer, who, as already stated, was cooking for the men at the mill, gives the following account of the discovery of gold, the circumstances under which it occurred and the history of the first piece of metal picked up. Her husband and Marshall, she says, were walking together down the race, when they saw this piece of metal, both at the same time, though Marshall being a little ahead was the first to pick it up. Neither of them knew what it was, though both surmised its true character, her husband being so impressed with the belief of its being gold that he brought it to her and insisted on her boiling it in lye, which was accordingly done. After standing this test so well, Wimmer, satisfied that it must be a noble metal, urged Marshall to take some of it to the fort and submit it there to further trials, which the latter consented to do, Wimmer staying at the mill and looking after the men and the work during his absence.

Marshall carefully preserved this first piece of gold for a time, saying he intended to have a ring made from it for his mother. But finally, being about to go away, having taken out a good deal of gold dust, and fearing he might lose this first piece of gold, he gave it to Mrs. Wimmer, both as a souvenir and as a means of greater security against its being lost. This occurred in the summer of 1848, and Mrs. Wimmer, who is still living, being a resident of San Luis Obispo County, has retained the specimen in her possession ever since. Though not rich, she has refused many liberal offers for it, being unwilling to part with it unless assured that it would be retained among the pioneers of California, or at least be kept in the state. Some years ago the Society of California Pioneers attempted to treat with Mrs. Wimmer for this interesting relic, which, owing to a failure of negotiations, still remains in the hands of its long-time owner.

*This series of articles will be issued in a new form, with other matter, during January, 1884. Rights reserved.

A Simple Rain Gauge.

EDITORS PRESS:—I think some of your readers may like to have a simple form of rain gauge, and I have pleasure in sending you directions for making one, at an outlay of but a few cents, that will serve every purpose where an exact scientific record is not demanded.



RAIN GAUGE.

Let the tinsmith make a funnel with a small—say one-quarter inch—opening at bottom, and having a two-inch band soldered round the top, as shown in sketch, to prevent the rain that falls within it splashing out again. The upper edge of this band must measure an exact 8 inches in diameter. Take a good large bottle—an ordinary wine bottle will serve, but in localities where the rainfall is heavy something larger is preferable—into this bottle measure 3½ fluid ounces, and mark the bottle at the water level: so on till the bottle is filled, marking the water level of each added measure of 3½ ounces.

Each of these gradnations shows one-eighth inch of rainfall. For convenient reference the gradnations may be marked on a strip of paper and gummed outside the bottle.—J. W. F., Stocktou.

CHROME IRON.—A discovery was recently made in this county which possibly may lead to the development of another of the many industries for which the county is famous. C. Borger, Superintendent of the Campo Seco Copper Mining Company, on the 10th of October, made a location of a chrome-iron lode in the John Bull mining district. Mr. Borger took some of the ore with him to San Francisco a few days ago, and an assay determined that the ore contained about forty-five per cent of chrome. Chrome iron is usually found in deposits, but in this instance it is found in leads or lodes, from one to three feet in width, and the formation is similar to that of quartz. There is considerable excitement in Campo Seco and vicinity, and quite a number of locations have already been made. As the discoveries are within a few miles of the proposed terminus of the S. J. and S. N. R. R., it may prove quite an important industry.—*Calaveras Citizen.*

COPPERAS.—The estimated production of copperas in this country during the year 1882 was 15,000,000 pounds, having an average spot value of three-quarters of a cent per pound. This material is largely made from the waste oil of vitrol from wire and galvanizing works, with scrap iron. It is also made from alum shale. The principal centers of production are as follows: Worcester, Mass.; New Haven, Conn.; Buffalo, N. Y.; Philadelphia, and Johnstown, Penn.; Cleveland, and Steubenville, Ohio; and St. Louis, Missouri. Its principal uses are in paper and print mills, bleacheries, dying establisments, chemical manufacturing establishments, paint and ink manufactories, and for sanitary purposes as a disinfectant.

Astronomical Notes.

The following short papers were read before the California Academy of Sciences at its meeting of November 5th, by the President, Prof. Geo. Davidson, of the U. S. Coast and Geodetic Survey:

Note on the Appearance of Saturn.

Upon turning the 5.4 inch equatorial of the Davidson Observatory upon Saturn about nine o'clock in the evening of October 29th, it was at once made evident that the object was unusually steady for this region.

I had failed to get any transit observations because the spider lines of the reticules of the instrument were so limp and slacked up by moisture in the atmosphere that they were unfit for work. Even when they had been heated and straightened out, they lost their tension in two or three minutes. The evening was clear and pleasant, and nearly calm, and the smoke of the city was to the southeastward. The atmosphere was charged with aqueous vapor, and the dew ran down the observatory almost like rain.

With a moderate power the division of the ring of Saturn was visible all around, and the gauzy or dusky innermost ring was made out. With a higher power the details came out marvelously clear and sharp, notwithstanding frequent shiverings of the image from atmospheric disturbance. The dusky ring was wonderfully well defined on its inner edge, and the main division of the principal ring was distinct and well cut; the division of the outer ring was made out further than given in the well known Cambridge drawing. The shadow of the planet on the ring was so well defined that the irregularity at the subdivision of the ring was unmistakable, the equatorial beltings were better defined and more marked than in the drawing referred to; the equatorial region was whiter than towards the poles; the line of dark clouding along the south border of this white belt was very distinct and in marked contrast therewith; the edge of the planet was traced around on the ring by its difference of color; the faint yellow green olive tint of the planet was in marked contrast with the white of the ring; the principal ring was toned faintly down as if exhibiting some of the features of the gauzy ring, but the separation of the two was distinct. There were six satellites visible. But one of the best revealed features of this spectacle was the undoubted difference in brightness of the gauzy ring at the two ansæ. The preceding part was decidedly brighter than the following ansa. Different eye-pieces and different powers were used, but this peculiarity remained. Mr. Marr noted it under all the circumstances in which I examined it. I have no doubt whatever of the matter. This phenomenon may have been described before, but I have no remembrance of meeting with it. I thought also that the inner edge of the gauzy ring was more than half way from the inner edge of the principal ring to the body of the planet; but under examinations with different powers and eye-pieces, I had some doubts. I made no measures.

Another feature was the apparent deeper shading of the preceding side of the planet: it was only a very little difference, but I was satisfied that it really existed.

I should mention that in my limited experience in examining Saturn I have never seen the atmospherie conditions so nearly perfect as they were that night. It was an exceptional instance in very many years. In this one case I saw more than is given in the beautiful Cambridge drawing.

Solar Eclipse, October 30, 1883.

The predicted time of the first contact of the moon's limb with the sun, and the point of contact, were computed for the Davidson observatory.

This predicted time was 3 hours 46.1 minutes; and the point of contact was 248 deg. 59 min. from the north point reckoned round by the east, corresponding to 203 deg. 43 min. from the vertex of the sun also reckoned through the east.

The observation was made with the full aperture of the 6.4-inch equatorial, using Airy's double-image micrometer, with a power of over 200 diameter. The color-glass exhibited the sun's disk of a whitish pearl color. The position thread was placed to cut off that segment of the sun's disk upon which the moon would first appear. The clockwork kept the image in the center of the field.

The border of the sun was much disturbed by the unequal refraction of the warm and cold strata of the atmosphere, so that the first contact was obtained under certain difficulties. The moon appeared exactly at the predicted position, and the local meantime of the contact was 3 hours and 46 minutes and 14.6 seconds, or eight seconds after the computed epoch. It is probable that this time may be a half or even one second late.

After this observation another eye-piece was introduced, and the projected image of the sun's border was exhibited upon a white paper screen, showing the ingress of the moon's dark limb, the groups of sun spots, and the disturbed border and cusps.

The time of greatest observation occurred just before sunset, when the moon had advanced .454 sun's diameter on the disk of the latter. Owing to the abnormal refraction so near the horizon, the sun presented the appearance of a very flattened eclipse, and the moon's disk was also similarly distorted, so that the distortion of the cusps was very striking and peculiar. At that time the boiling of the sun's border was excessively great.

There were two lines of sun spots across the solar disk, one north and one south of the equator; some of them were very large, and one group was visible to the unassisted eye. The faculæ upon the surface were fairly well made out.

The geographical position of the Observatory is: Latitude 37 deg. 47 min. 24.1 sec. north; longitude, 122 deg. 25 min. 37.6 sec. west, or 8 h. 9 min. 42.5 sec. from Greenwich.

A Brilliant Meteor.

On the evening of October 29th, at 11 o'clock, a remarkably brilliant meteor passed vertically downwards very near to Eridani (3 mag.). It illuminated the street, and its light cast a strong shadow. The train, about 5 deg. long, was persistent for three or four seconds, with an intense, vivid brightness, then faded away to a white, vaporous looking streak, which assumed a wavy motion for three or four seconds and then vanished. The color was an intense white, tinged with a purplish hue; and the brightest part of the train which was left was not at the point of disappearance but about the middle of its length.

Alum.

Native Alum.

Alum appears in the form of an efflorescence on argillaceous rocks in the Silver Mountain district, Alpine County, California, but the deposits are too light to be of much practical value. In the early part of 1875 the discovery of what was termed an alum lode was reported to have been made on Howell Mountain, Napa County, California. As is often the case with these reported finds, much was claimed for the extent and purity of this deposit; but as a very little alum from that locality ever found its way to market, the first accounts of this discovery were presumably much exaggerated. Some of the springs of the Geyser group, Sonoma County, also small springs near Owen's Lake, carry a small percentage of alum. Certain clays found in Santa Clara and Calaveras counties, in the same state, show a strong taste of alum; but if any valuable deposits of this mineral have ever been found in the Pacific division, the fact has not become generally known.

Alum occurs in small quantity at Mount Vernon, and in Jefferson County, Col. In other parts of the Rocky Mountain region small quantities of the mineral are found, but nowhere in economically available bulk.

Artificial Alum.

The alum of commerce is a manufactured commodity, and the supplies consumed in this country are both of the imported article, and that made in a few chemical works in the Eastern States, chiefly in Pennsylvania, New York and New Jersey, from alum shale, clay, etc. In the census year ending May 31, 1880, the production of artificial alum in the United States was 39,217,725 pounds, valued at $808,-165.

The production of artificial alum in 1882 amounted to between 16,000 and 20,000 tons, which at two cents per pound would be worth from $640,000 to $800,000. Nearly all was made from alum clays brought from France and England but the manufactured product is said to be superior in quality to that imported from England. The process of manufacture is very simple, consisting in mixing the clay with sulphuric acid, dissolving the sulphate of alumina thus formed, and then adding a solution of sulphate of ammonia and crystallizing the resulting salt. The leading manufacturers are Messrs. M. Kalbfleisch's Sons, of New York City and Buffalo, Chas. Lennig & Co., Harrison Bros. & Co., and Powers & Weightman, of Philadelphia; and the Pennsylvania Salt Co., of Philadelphia and Pittsburgh.

Gold Saving.

Peter Eddy and J. G. Hartwell, of Nevada City, received letters patent for a new form of amalgamator and grinder, the object of the invention being principally to render profitable the further reduction of quartz tailings known to contain free gold, but classed as of too low a grade to be worked with the ordinary apparatus now in use. The following are among the special claims of the inventor: A machine of ordinary size has a capacity of treating all the pulp that comes from a five-stamp battery, and can be geared to grind little or much as may be desired without sliming or impairing the condition of the sulphurets for concentration, but rather bringing them to a uniform size, which will increase the capacity of the concentrator, as it is continuously separating the previously slimed particles and light waste from the heavy and valuable particles, grinding only that portion that requires to be ground. The wearing parts of the machine are of such a character as to be worn down evenly. They consist of shoe and dies that do not plow through the pulp, as is the case with the common grinding-pan. The shoe and dies may be worn much thinner, on account of the even wear, before being replaced. The machine being of such large capacity for treating low-grade ores or tailings, it is destined to work its way between the concentrators and the battery, on account of its rapid and improved qualities of separating, amalgamating, and little or much grinding as may be required.—*Transcript.*

MECHANICAL PROGRESS.

Cast Iron of 47,500 Pounds Square Inch Tensile Strength.

The average tensile strength of cast iron being 25,000 pounds to the square inch, the extraordinary strength of the mixture below given demands the widest circulation among engineers. If it can be made uniform, it increases the usefulness of cast iron very greatly. Edward Gridley, member of the Institute of Mining Engineers, says, in *Van Nostrand's Magazine*: "A little more than a year ago, at the Wassaic furnace, Dutchess County, N. Y., we made a few hundred tons of iron from a mixture of two thirds raw carbonate and one-third Chateaugay ore, hoping that it would be suitable for steel purposes, but as the iron showed phosphorus .189 per cent, it was not offered. This iron looked well and seemed strong, and gave good results in malleable castings, but no special tests of strength were made. About February 1st, of this year, we began using two-thirds roasted carbonate and one-third Chateaugay, and noticing that the iron was stronger than usual, we had two samples tested, which showed tensile strength of 32,014 and 34,176 pounds per square inch. After our stock of Chateaugay ore was exhausted we put on one-third raw carbonate with the two thirds of roasted carbonate, and the first test made of the iron showed 40,008 pounds per square inch. The three tests given above were made by Mr. A. J. Copp and Mr. E. B. Manning, of the Phœnix Furnace, Millerton, N. Y. Since these tests were made they have broken samples made with all carbonate ore as follows: 39,669, 40,816, 41,882, 42,281, 39,902 and 40,130 pounds per square inch. A test taken from the same bed of iron as the last mentioned, 40,130, was broken, showing 40,151 pounds per square inch. A sample broken at Stevens' Institute, under direction of Prof. R. H. Thurston, showed 40,000 pounds per square inch. Another sample was broken by Prof. Thurston on his torsion machine, and gave torsion 7° and tensile strength of 44,500 pounds. And still another sample, tensile strength 47,500 pounds per square inch. The average of the thirteen tests by Fairbanks is 41,349 pounds. These tests were all made from iron cast in the pig-bed, direct from the furnace. Some were made from the full pig turned down, but most of them from samples obtained by making a hole in the sand at the end of the pig, from 10 to 20 inches long and about 1¼ inches in diameter. No tests have yet been made from the remelted iron."

Engine Details.

Nothing is more interesting than the very different and sometimes opposite opinion on the construction of the details of machines or steam engines. One would think that the superlative could be decided scientifically if the subject was carefully studied and no great divergence from the best for the place and purpose be seen in articles from the best designer's hands. Yet we are told by some that the halved box for an engine shaft, babbitted and bolted, is the best. The more ancient designer retains his old opinion of the quarter-box with good adjustable wedges, and it is the best, money not considered. The engines having the halved box are in no need of cheapening the construction to secure trade; in many instances, therefore, that form is best at any price, presumably. From the user's standpoint, his experience is the relative amount of trouble had with the thing. He will not always carefully discriminate between the proper and improper usage, and in many cases condemns unjustly. This is brought up for thought on the complaint of an engine with a bent crank and bolted half-boxes, that it pounded and had cost a great deal of annoyance and the customer was unsatisfied after a year's use. The box gets the blame — it may be in the care, it may be in the defective construction of some other part, an unbalanced crank or pulley, or the pound may be elsewhere. If everybody used this form of box and approved it, the user would not complain. Now, how nice it would be if we could lay before such complainants that our plan is the best and give good honest reasons. There is in machinery a great difficulty in determining the location of a fault. Cases are known where several good men could not agree. A recent narrative of locating a pound by the indicator may lead experiments in a direction that will be profitable.—*Cin. Artisan.*

LEAD-LINED JOURNAL BOXES.—The remarkable performance of some lead lined brass journal boxes on a certain railroad ought to cause a careful investigation of their value by machinists generally. These boxes, when first put in, at once take a bearing over their whole length, and as the thickness of lead is a mere nothing, the maximum being but little over one thirty-second inch, the journal soon obtains a well fitted bearing in the brass without any danger of heating or cutting. There is an old story current among Eastern railroad men of a car loaded with valuable perishable freight which ran into one of the Springfield depots with journals badly cut and boxes on fire. It was a question how to save the freight by getting the car through to its destination at once. The remedy was a peculiar one. A brass was extemporized and made to fit the journal by putting in strips of sheet lead, so as to get a bearing for its whole length. The combination brasses were slipped into place, well oiled, and the car sent on its journey. The remarkable part of the thing, however, was that shortly afterwards the car reached Springfield on its return with the identical brasses still under it. It had evidently got through all right, and nobody had seen any occasion to find any fault with its performance.—*Mechanics.*

Testing the Physical Changes of Metals.

A paper was read at the recent New York meeting of the American Society of Mechanical Engineers, by Prof. Thomas Egleston, on a a machine for observing the physical changes of metals. The machine was suggested by the breaking of a railway rail, different portions of which, when subjected to the ordinary tests, were found to exceed the required degree of strength.

The paper was prefaced by a short account on the breaking of rails and the fatigue of metals, in the course of which the author advocated discarding the term hardness and substituting abrasive resistance. The term hardness was remarked to convey no distinct meaning, signifying in some cases brittleness, in others toughness, and in still others comparative softness. Without going into particulars, we would here state that Prof. Egleston's method of testing the hardness of metals, or their abrasive resistance, as he would term it, embraced the use of a drill in connection with the specimen to be tested. This special point elicited considerable discussion, Mr. Towne suggesting that the operation of cutting the metal scarcely seemed to be a fair test, its accuracy depending upon the temper of the cutting tool, its angle, temperature of the material, and other equally important factors. Again, when using a drill as in the machine described, different portions of the tool worked at greatly varying speeds, and one of the members thought that by first drilling a small hole in the specimen operated upon, so as to allow only the more rapidly moving points of the drill to perform work, more satisfactory results might be obtained. The use of lathe or planer tools was proposed as still other remedies for what were considered as defects in the appliance. As already stated in the preceding remarks, the discussion in this case also gradually drifted away from the original subject, interesting comments being furnished as to the manufacture and composition of brass, copper and copper castings.

A NEW USE FOR BIRCH BARK.—The subject of absolutely water-proof cloth has long occupied the attention of scientists. Some years ago an Italian, Signor Muritans, supposed that he had satisfactorily solved the problem of Egyptian cloths being entirely indestructible, and he patented a material of the kind, the only objection to which was the cost. And now M. Peron, a Belgian, comes forward with an invention of a similar nature; having ascertained that bands used to smooth the heads of Egyptian mummies were impregnated with a kind of resin, he has had recourse to a substance from birch bark, and which is now used to perfume Russian leather. When the fine white bark of the birch tree is distilled it yields a red oil, nearly one-fourth of which consists of the special phenol or carbolic acid which gives a well known odor to Russian leather. It is now found that the residue or green tar of the birch yields neither acid nor alkaloid, and it forms with alcohol a solution of great fluidity, which, however, when once dried, is unacted upon by alcohol. It is this substance which will unite with the most brilliant colors, and is used by M. Peron for treating textile fabrics.

WATER JACKET FOR IRON FURNACE.—The Allentown *Chronicle* says: "The new water jacket furnace in Reading, Pa., owned by Henry S. Eckert, has now been in blast about one week, and up to this time the result has been very satisfactory; thirty tons of iron are being made daily, but it can be increased to forty. This is the only furnace of the kind in the United States. It was designed and built by David Campbell, the Superintendent of the furnaces. The jacket surrounds the furnace to the height of 19 feet 9 inches. It is made in sections, so that if any accident should occur to either section it could be replaced. Between the outer and inner plates of the upper section is a thickness of five inches of water, and in the lower section four inches. The fresh water is constantly running in above, and is allowed to flow off below through pipes. The experiment is watched with great interest by furnace men throughout the country."

PRESERVING WOOD.—An exchange says that a plan recently introduced into Belgium for preserving wood from decay produced by the atmosphere, water, etc., is to fill the pores of the wood with liquid gutta pereha, which is said to effectually preserve it from moisture and the action of the sun. The process employed consists in exhausting the air from the pores of the wood and filling them with gutta-percha solution. In pouring the solution into the pores, the solid gutta-percha is liquefied by mixing with paraffine in proportion of about two-thirds of gutta-percha to one-third of paraffine; the mixture is then submitted to the action of heat, and the gutta-percha becomes sufficiently liquid to be easily introduced into the pores of the wood. The gutta-percha, liquefied by this process, hardens in the pores of the wood as soon as it becomes cold.

SCIENTIFIC PROGRESS.

New Metallurgical Discovery.

At a recent meeting of the British Association, Prof. Chandler Roberts described some most suggestive experiments on the mobility of gold and silver in molten lead. Graham first ascertained the rate of diffusion of salts in solution; Dr. Guthrie has recently studied the diffusion in alloys; and Professor Roberts is now testing metals at temperatures above their melting points. If a lump of a gold lead alloy with 30 per cent of gold, covered with lead, is heated in a crucible, the gold appears at the surface the very moment when perfect fusion has been attained; the diffusion also takes place rapidly if the gold alloy is put in a small crucible, and this one placed within another crucible containing lead. By melting in a cylinder, 200 millimeters high, a solid cylinder of lead with a small piece of the gold alloy fused to its bottom, or, better still, by placing the gold at the top of one limb of a U-shaped crucible, withdrawing test portions from the top end of the other limb, Mr. Chandler Roberts arrived at the diffusion rate, 300 millimeters in five minutes for silver, this rate being probably a little higher than that of gold.

Sir William Thomson characterized this as a great discovery. The rate of diffusion of gold in lead, he said, appeared to be immensely greater than the rate of diffusion of liquids. The fact was, it was a subject of which we understood very little indeed, but which would probably prove of great value in metallurgy, where one example of it, the rapid mixture of spiegeleisen with iron, was well known. If the experiments were repeated with salt and water substituted for the gold and lead, it would take years—twenty years at least—to produce the result now attained in forty minutes, and which took place not much less rapidly than the diffusion of oxygen through hydrogen, or the transmission of heat through iron.—*Scientific American.*

MOTION OF GLACIERS.—It has been known for some time that there are long periods of time during which the Swiss glaciers advance down or recede up their beds. Thus, in 1741 they were advancing, but it was reported that in 1700 it was possible to walk from Chamounix to Courmeyer over the Col de Geaut without touching ice. They advanced all last century so far as is known, and up to 1817, then went back until 1840, advanced till 1859, and have since been receding till the present year, when many, including the Mer de Glace and the Rosenlaur glacier, have begun to advance. Observations were made during the past summer on the Glacier des Boissons, at Chamounix, and the important conclusion has been arrived at that the rate of motion of the same point on a glacier changes greatly from day to day. It was shown that while during the day the hourly rate or motion of one point observed was only .6cm., during the next night it advanced at the rate of 5.5cm. per hour. The rate of other points examined varied, but not so greatly. The change occurring at the foot of the glacier when it comes into the valley was also noticed. The downward motion of this point is determined by the fact that the parts above advance more quickly than the ice at the foot melts away. It was found that on one side of the glacier, where it rested against a bowlder, there was no apparent change in the outline of the ice or in the position of the bowlder during the day, while at the other side the end had moved in the same time 4 or 5 feet.

OCEAN FORMATIONS.—In discussing a paper upon the North Atlantic area, which, in the opinion of Professor Hull, was dry land when the regions of North America and those of Great Britain and Western Europe were submerged, Dr. Carpenter said before the British Association, recently, that the conclusion he had come to from the Challenger expedition was, that the bulk of the sea below the present sea level was to the bulk of the land somewhere about 20 to 1. He thought, taking the elevation of the different continents altogether, an elevation of 1,000 feet might be considered as about the average. On the other hand, the depression of the great oceanic area below the level of the sea might be stated at an average of about 13,000 feet. The elevations of land which in any way approached the same height were ridges, and one of the most remarkable facts brought out by the Challenger research was that there were strong reasons to believe that all oceanic islands were volcanic. In all their researches they found no indications of submerged land over these areas.

DISTILLATION IN VACUUM.—H. Schuller has observed the behavior of thirteen inorganic and twelve organic bodies when heated in a vacuum, their sublimations and distillations, and the nature of the residues. Many of the elements examined, especially selenium, tellurium, cadmium, zinc, magnesium, arsenic, and antimony, were capable of sublimation, while the very fusible metals, bismuth, lead, and tin, distilled with difficulty, the last mentioned scarcely at red heat. On the other hand, Demarcy found bismuth volatile at 202°, lead and tin at 360°, which Schuller explains by the presence of volatile impurities. During the whole time of the distillation of a metal an escape of gas was observed; but on repeated evaporation this phenomenon was imperceptible, or very slight. Sodium, selenium, tellurium, cadmium, zinc, arsenic, and antimony evaporate so readily in a vacuum that this method may be used for their purification. Among organic bodies many unstable mixtures, such as tallow, wax, and resin, distil so easily in a vacuum that they may thus be separated from impurities.

LIQUID OXYGEN AND NITROGEN.—We are slowly learning more of the liquid and solid states of the elementary and compound bodies formerly known as permanent gases. According to the latest researches, oxygen, when cooled to 213 degrees F., liquefies to a colorless transparent liquid at the very moderate pressure of 23 atmospheres, or thereabouts. Nitrogen at the same temperature does not liquefy at a pressure of 150 atmospheres, but yields a colorless liquid, with distinct menisens, when the pressure is cautiously allowed to fall to a point not lower than 50 atmospheres. It is now well known that ozone, under quite moderate limits of pressure and temperature, is a liquid of intensely blue color, which gives a vapor which can only be compared in color with the brightest blue sky. In this condition ozone is a most potent body, decomposing with explosion upon slight provocation into common oxygen. Pure alcohol is a white solid at about 202 degrees F. At a very slightly higher temperature it is viscous, like oil.

THE DIMENSIONS OF ATOMS.—In a recent lecture at the Royal Institution, by Sir William Thomson, on the size of atoms, the speaker, through a series of learned considerations which can not be given here, reached the following conclusions: It is very probable that in an ordinary liquid, or a transparent or semi-opaque solid body, the mean distance between the centers of two contiguous molecules is less than one five-millionth of a centimeter, and more than one billionth of a centimeter. To obtain an idea of the grain and of the corresponding relative sizes, let us imagine a globe of glass or water of the size of a croquet ball (16 centimeters in diameter), and let us increase it in imagination until it becomes as large as the earth, each molecule being increased in the same proportion. Then the structure of this mass thus increased would be more granular than that of a pile of musket balls, but certainly less so than that of a pile of croquet balls.—*La Nature.*

MELTED WOOL.—M. Heddebault has discovered a method of preparing soluble wool from tissues in which wool and cotton are combined. When subjected to a current of superheated steam, under a pressure of five atmospheres, the wool melts and falls to the bottom of the pan, leaving the cotton, linen and other vegetable fibers clean and in a condition suitable for paper making. The melted wool is afterwards evaporated to dryness, when it becomes completely soluble in water, and is called azotine. The increased value of the rags is sufficient to cover the whole cost of the operation, so that the azotine is produced without cost. It contains all its nitrogen in a soluble condition, and can, therefore, be compared to dried blood, which is worth 2.50 francs per kilogramme of nitrogen. M. Ladureau regards this discovery as one of great interest for agriculture and mechanical industry.—*Soc. Industr. du Nord.*

EVOLUTION.—The doctrine of transformation—man descended from the monkey, the monkey from some inferior animal, and this last from some animal still lower in the scale of beings, descending thus to the original polyp—has been considered exclusively a modern doctrine, perhaps thought of originally by Diderot, but of course principally credited to Darwin. However, there is nothing new under the sun, and M. Halevy, of the Academie des Inscriptions et Belles-lettres, has found among the works of an individual named Sanconiathon, who lived, according to the savants, about the fourth century B. C., the following passage, which was reproduced from the original work by Philon of Byblos, and later by Eusebius: "(Then) there was [on the earth] living beings deprived of intelligence, from whom descended beings gifted with intelligenee, who were called Zophasamin, contemplators of heaven."

ZYLONITE.—The newest discovery in plastic materials is zylonite. It is superior in many respects to celluloid, in that it can be formed into flat plates almost transparent, so it can be used instead of glass for stained windows. The discovery of this composition was made about fifteen years ago, although the company at present engaged in its manufacture has been in existence less than two years. The basis of zylonite is white tissue paper, made from cotton or linen rags. It receives a bath of sulphuric and other acids, which produces a chemical change. After the acid is carefully washed out the paper is treated with a mixture of alcohol and camphor. It now assumes an appearance resembling parchment. In this condition it may be worked into plates of any thickness, will receive the most brilliant colors, or may be made perfectly transparent.

POTASSIUM RECOVERY.—Water used in wool washing yields 4.50 per cent of a very dry potassium, which can be recovered, says M. Delattre, at a considerable profit.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

RICH STRIKE.—*Ledger*, Nov. 17: An important strike has been made in the South Spring Hill mine near Amador City. This mine is owned by Boston capitalists, and has been operated for the past four years under the superintendency of John R. Tregloan. In the face of many discouraging prophecies from mining experts he has kept steadily on with his work, not only having faith in the claim himself, but inspiring confidence in the stockholders to such an extent as to lead them to put up the funds to carry on prospecting for four years. During the whole of this time Mr. Tregloan has never seen the color of gold in any rock from the shaft, until the present strike. The shaft has been sunk to a depth of 600 ft. After reaching this depth, a drift was run eastward. Last week when this drift had reached a distance of 60 ft, a fine body of quartz was met with, between the granite and slate formations. The ore is streaked with dark lines, and known as ribbon rock, which is very similar to that in the Keystone mine. It carries a large percentage of sulphurets. Assays of specimens have given over $500 per ton. We were shown on Tuesday samples which would assay much higher than that. The whole face of one piece was covered with specks of fine gold, whilst the reverse side was studded thickly with sulphurets. The ledge has been penetrated 3 ft, without getting through it. The Talisman mill, purchased by the same company, is being fixed up. The ditch has been cleaned out, and if water can be had, the mill will get to crushing next week. It is intended to run through 200 or 300 tons as soon as possible. The prospect is also encouraging for the Talisman mine to start up at an early date.

The *Sentinel* says of the above strike: It is only second to that made at the Nevills mine recently. The ore is of hard ribbon throughout, and gold can be discovered in every portion of the rock, the whole 5 ft across. An assay proved the presence of $514 gold to the ton and some silver. Other rock that has been taken out will go $1,500 to the ton.

NOTES.—*Sentinel*, Nov. 14: The Matson mill at Butte City will start to crushing next week. The mine has a 3-ft ledge of good rock. The Talisman mine of Amador City, which is owned by the same parties as the South Spring Hill, will start up in the spring. All the mills with the exception of the Zeile are now running on water from the canal. They have nearly a full head running in from the river. Spagnoli & Hutchings of Clinton are digging a large ditch three-fourths of a mile long to take water from the south fork of Jackson creek to their placer claim. S. G. Spagnoli is working a quartz claim near Clinton which at a depth of 40 ft has a ledge 10 ft wide. He is having a tunnel run in from an adjoining gulch that when 150 ft in length will tap the ledge at a depth of 200 ft. The work of digging the receiving reservoir for the Plymouth mines is being vigorously pushed. Forty more men went on this week. The reservoir is intended to hold water enough to run 200 inches for 24 hours. The large reservoir in Tyler's ranch is intended to hold sufficient water to run 200 inches for 3 months. A large force of men is employed on Slate creek.

VOLCANO.—*Dispatch*, Nov. 17: The mining interests are looking up since the last rains. The Tunnel Co. are only running part of the time as the scarcity of water will not permit. Gillick & Phillips have struck it very rich in their mine. We have seen the rock which we think will go $100 to the ton. They are going to sink 100 ft on it immediately. Robert Stewart has leased the Tellurium mine and has started to work on it.

DOWNS.—The mill will start up with its full capacity—20 stamps—this week. The ore that has been taken out lately from the old shaft is of splendid quality.

Calaveras.

WEST POINT.—Cor. *Citizen*, Nov. 17: The Scorpion is running a full set of men night and day. The ten-stamp mill now building at the Star of the West will soon be completed. The mine, we believe, will prove to be a bonanza. At a depth of 170 feet the ledge is about 15 inches in width and the ore will yield $30 per ton. The drift north of the shaft extends 90 feet, and the ledge at that point is about 3 feet in width, and quite rich. The Sterling mine is showing well and work is progressing finely. Mr. Sterling will soon start his mill and arastra. Mr. Desmond is pushing work on the Wood House mine. We are told that the Valentine Hill mine will soon be worked.

LAMPHEAR.—The *Chronicle*, Nov. 17th, insists upon the truth of the Mint Director's report upon this mine, in these words: That the mine embraces 1,800 feet in length, of a well defined ledge; that there are two shafts sunk upon it, 160 and 130 feet respectively; that a level 300 feet in length has been run showing a solid, well defined ledge averaging 5 feet in width the entire distance; an excellent 12-stamp mill run very cheaply by water power; with hoisting works and other neeessary machinery; average yield of ore per ton, $7; cost of extracting and milling, $3.50, are all facts that can be substantiated by reliable persons who are ready to certify to the correctness of the statements.

El Dorado.

KELSEY.—Cor. Placerville *Democrat*, Nov. 17: The mining outlook of this place is somewhat brighter. Quite a number of capitalists have been visiting the most prominent mines. Among them Mr. Bibbons, who intends commencing developments on the New York mine by the 1st of next month. The Baltimore mine has suspended operations for a brief period, to resume on a larger scale, after the return of the Supt. The Delmarcia mine and others still continue good.

GARDEN VALLEY.—Georgetown *Gazette*, Nov. 16: We have seen some fine specimens of copper ore this week from the ledge now being prospected in the Halcyon Copper mine, near Garden Valley. The ledge is 6 ft wide, looks well, and ranges all the way from 10 per cent to 60 per cent in copper, besides some silver and gold. The prospectors are much elated.

EUREKA STAMP MILL.—We learn from Mr. Benjamin that work for the new stamp mill on the Eureka is progressing favorably, and that the first load of lumber arrived on the ground to-day.

Inyo.

POTOSI TUNNEL.—*Independent*, Nov. 10: The ledge uncovered in the Potosi tunnel some time ago has now been explored by a cross-cut extending 53 ft from wall to wall and by a drift on the vein 30 ft west on the ledge. In this drift has been found some of the finest ore, the best since the original work was done on the "big cut," of the Ygnacio, near the surface from which was extracted several thousand dollars.

RUSS DISTRICT.—The May Queen mine, in Russ district, above the Brown Monster, and apparently on the same vein, is being worked with good results. Within a short time they have extracted 40 tons of fine galena ore, 10 tons of which are now sacked for shipment. The ledge is 3 ft wide.

CERRO GORDO.—Active work is being done on the Nemesis, St. Paul and Carbonate mines. In the first a large pocket of rich galena ore has been recently struck. They are down about 80 ft on the Carbonate, and have a good vein of quartz rich in gold and silver. This mine is a relocation of an old claim.

INDIANA MINE.—On Saturday, 6 ft north of the old works in the Indiana, Swansea district, a fine ledge of the rich ore for which this mine has been celebrated was uncovered, the samples of which assay from $1,500 to $6,000 per ton in silver.

A NEW STRIKE.—Report comes from Cerro Gordo that a 4 ft ledge of fine silver-bead ore has been opened in the Abalone mine, and in the North Extension of the Union.

Mono.

MAY LUNDY.—Homer *Index*, Nov. 17: No material change to note in the May Lundy since last report, except continued improvement in quantity and quality of ore with every foot of progress in the south drift on the 130-foot level below the lower tunnel. All the stopes are looking well, and are yielding large quantities of high grade ore. One hundred and ten men are now employed in the mine.

GORILLA.—The recent cold nights reduced the flow of water to such an extent that the Gorilla Co. has been compelled to shut down its reduction works, and in consequence the working force in the mine has been greatly reduced.

NOTES.—All the arastras in Mill Creek and Lake Canyon have been closed down on account of accumulating ice. The White Cloud, a short distance from the May Lundy, shows fine development. Pat Ragen is engaged in the development of the Mountain View. A good deal of "assessment work" is being done on claims, and numerous campfires may be seen nightly on the mountain sides, 2,000 and 3,000 feet above the town.

STANDARD CON.—Bodie *Free Press*, Nov. 16: During the week ending Nov. 10th there was shipped to the mills 1,357 tons of ore, and 1,000 ounces of crude bullion received. The upraise from south drift No. 2, 1,000-foot level, has been raised during the past week 11 feet, total height 123 feet. The vein is 5 feet wide and looks well.

BULWER CON.—During the week the north drift, 700-foot level, was advanced 13 feet; total length 440 feet, with nothing new.

Nevada.

IRONCLAD.—*Transcript*, Nov. 15: The revival of work at the Ironclad mine has infused considerable life in Rough and Ready and vicinity. The workings have been pumped dry, and some excellent looking ore is being extracted from the 100 level and also from the bottom of the shaft.

CEMENT.—The two 10 stamp cement mills at You Bet, one of which is being built by the Birdseye Creek Co. and the other by the South Yuba Co., are nearly ready to start up. They will be used in crushing the cemented auriferous gravel.

HOCKING.—*Tidings*, Nov. 16: The contractors who were working on the Hocking ground on Auburn street, had a clean-up on Wednesday of 45 loads of gold quartz, yielding $30 per load. The contractors, Abram & Co., have been working about 8 weeks and made on an average, clear, $4.25 per man per day. The shaft is about 60 ft deep, disclosing a ledge from 6 to 15 inches in thickness.

Placer.

FOREST HILL.—*Herald*, Nov. 17: The Washington Co., a short distance north of Forest Hill, have a considerable force of men at work, and are sinking a shaft in hope of striking the big channel of that divide. They are down over 100 ft, and are preparing to put up improved hoisting machinery. In the vicinity of Forest Hill there is more stir and more life than for some years.

DUTCH FLAT.—A. A. Ferguson says nearly all the miners at the Flat are expecting to do some work this winter, though very few are going to any expense in fitting up in consequence of the uncertainty of being allowed to continue. The slickens agitation, he says, is proving a grand harvest for the Chinamen. Nobody shows any disposition to molest them, and as a result they are either buying or leasing nearly every mine that has anything in it.

ALTA.—Dutch Flat *Times*, Nov. 17: Work in the new shaft on the Alta Mining Co.'s claim is progressing. A depth of 140 ft has been reached. At a depth of from 190 to 220 ft the bedrock is expected to be reached, when drifts will be run in either direction in search of the main channel. Some flattering prospects in the higher gravel have been cleaned up.

Plumas.

ELIZABETHTOWN.—Quincy *National*, Nov. 17: Loring & Leavitt are making arrangements to put a steam pump in their mine. The channel looks better than ever, and the gold is coarse, one piece picked up a few days ago weighing three ounces. It is encouraging to know that the deep channel comes down into the Riverdale claim, and the indications are strong that it will be found all the way through the O'Neill ranch, and in the ranch of Mr. Mills below.

ARCADIAN.—Greenville *Bulletin*, Nov. 14: For some months past the proprietors of the Arcadian mine have been running a tunnel to explore the ledge at a greater depth; the tunnel reached the ledge last week, a drift was started, and an ore body opened up that is much superior to any found in the upper tunnels.

NOTES.—John Ellis turned on the water upon his claim at Providence Hill about a week ago. He is confident he has struck a good thing. Loring and Leavitt have struck good ground and are taking out gold. So far from being worked out, the claim is likely to yield better than ever.

San Bernardino.

RED ROVER.—Calico *Print*, Nov. 17: This mine, under the foremanship of Harry Clay, is developing finely. Harry says he has thirteen tons of first-class ore on the dump, and every thing looking lovely below.

SUE.—Mr. J. B. Osborne has three men at work at the mine and building a road from the Falls to the Mammoth road.

CUBA NO. 1.—Keys & Co. are working steadily and taking out fine ore.

SAM HOUSTON.—Two men are at work on the No. 2 sinking a shaft and taking out ore. This claim is now owned by Wm. Raymond, of the Garfield mine.

PINACARTE.—San Bernardino *Index*, Nov. 10: Mr. T. J. Bryant, who has been prospecting in the vicinity of Pinacarte for weeks past, has been rewarded in finding a ledge of tin ore which is claimed to be an extension of the famous Temescal tin mine ledge. Seven claims have thus far been found and located, and the ore brought to Riverside taken from the surface out-croppings compares favorably with specimens taken from a depth of 160 feet or more in the Temescal mines.

TUJUNGA.—Los Angeles *Herald*, Nov. 10: This is at the head of Tujunga Canyon, 30 miles in a direct line northeast from this city. The ore from this mine has been worked by an arastra during the summer and has yielded at the rate of $60 per ton. With a quartz mill it should have yielded $100 per ton. The ore-bearing ledge is 16 to 22 inches in width, on which are four claims of 1500 ft in length.

San Diego.

MINNIE FEE DISTRICT.—Riverside *Valley Echo*, Nov. 14: We had a trip overland to the new gold fields last Saturday. These mines are in San Diego county 30 miles from this city, and about 6 miles southeast of Pinacarte station on the California Southern railroad, and are in what is known as the "Minnie Fee Mining district." We visited a number of mines, among them the "Nelson," located less than a month ago. The "Nelson" is developed by one incline 5 or 7 ft deep on the ledge. We have several pieces of ore showing free gold.

Shasta.

FLAT CREEK.—*Democrat*, Nov. 14: Weil, Conroy & Murray have decided to erect a quartz mill on the mine at Flat creek. The mill was ordered last week. It is the cannon ball pattern, with a capacity of crushing 5 tons every 24 hours. One of these mills has been running on Tom Green's claim in Deadwood, and has proven satisfactory. Dan O'Neal will also erect one on his claim above Buckeye.

TRINITY CENTER.—Redding *Free Press*, Nov. 10: Mr. Holland intends working the Holland, Rumfelt & Co. mine on Coffee creek this winter, which mine enjoys the reputation of paying regular dividends; this is no "dry gulch" or "winter claim," for it has a full head of water the year round. The Ella May drift mine is idle. Mr. Larson will start the wheel as soon as freezing weather is over.

Sierra.

RAINBOW.—*Tribune*, Nov. 15: At the Rainbow mine, below Alleghany, arrangements are being made to begin work in the upper stopes, and to start the mill. The two Burleigh drills are kept at work driving the lower tunnel. When completed, the tunnel will be 2,300 ft long, and will tap the vein 400 ft below the present workings. It can be authoritatively stated that the crew of Chinamen put to work in the lower tunnel a few weeks ago will be discharged in a few days, and their places filled by white men. The statement made that the Chinamen were armed with rifles by their employers last week was false.

ALASKA MINE.—Several months since, the hoisting works of the Alaska at Pike City were laid in ashes at a loss of $40,000 to the company. It was a glorious thing that previous to the burning of the works the mine had yielded handsome returns. On Tuesday of last week, the new machinery was put in motion, and the work of bailing out the shaft begun. Two tanks, with a capacity of 700 gallons each, are used for bailing purposes. On Friday, the shaft had been emptied of 70 ft of water. When the third level is reached, a steam pump will be put at work.

PLUMBAGO.—The Plumbago quartz mine, at Minnesota, has been bonded to parties in San Francisco. This mine has a good record. An 8 stamp mill was erected a number of years ago, and a tunnel run that tapped the ledge 60 ft below the surface. The ledge was worked on to that depth with handsome profits. Later on, however, in consequence of the lack of funds to prosecute developments, the owners were compelled to close down.

COLUMBO.—The engine and boiler are being placed in position at the Columbo mill this week. Superintendent Deidesheimer is building a residence and will remove his family to the mine as soon as it is completed. A force of men are grading for the tramway from the mill to the tunnel above.

NOTES.—The prospects of the Ruby mine were never brighter than at present. The working force is being added to daily. At the Sierra Buttes mine grading has been commenced, preparatory to building a tramway between tunnels Nos. 8 and 9. The new mill at No. 9 tunnel is nearly covered. Maxon & Van Slyke are pushing ahead work on the Maxon quartz ledge, in Pig Canyon. The gentlemen propose to erect a mill at the mine as soon as praticable. The extension of the Plumbago mine, at Minnesota, is owned by J. Boles. A tunnel is run on the vein and the owner is constantly taking out ore that pays him to crush in an ordinary hand mortar.

Tuolumne.

NOTES.—Sonora *Democrat*, Nov. 17: Work at the Oakland mine, near Columbia, has been suspended, owing to lack of water. The ditch for the Rising Sun mill will be finished in another week. The 25 stamp mill at Quartz mountain has resumed crushing ore from the Heslep mine. The 40 stamp mill of the Alabama mine, at Jamestown, will soon be started up. Gus. Weidekind is taking out about $6 per day to the hand from his gravel claim at Pine Log. The boiler of the Buchanan hoisting works has been repaired, and the works have been started up again. The work of putting up the Huntington quartz crushing mill at the Garibaldi mine is rapidly going ahead. The Knox & Boyle mill (10 stamps), at Quartz mountain, has been shut down owing to scarcity of water. It is the impression that we are on the eve of a mining boom. Old Tuolumne is bound to come to the front.

NEVADA.

Washoe District.

HALE AND NORCROSS.—*Enterprise*, Nov. 17: Ore of good quality was found in the east cross-cut from the north drift on the 2700 level; also, in the east cross-cut from the south drift. In these cross-cuts, however, the indications of water were so strong as to forbid the pushing of explorations to the east beyond a certain point.

UNION CON.—The station at the 3100 level, joint with the Sierra Nevada, is completed, and are now cutting out on the south side for a donkey pump. In cutting out to the west for the station, quartz of good character was encountered. It carries more silver than the streaks found in the winze. They will now drift north and south from the new 3100 station.

GOULD AND CURRY.—The winze below the 2500 level, joint with Best and Belcher, is in harder material. The peculiar streak of dark and decomposed rock has passed to the eastward. The work of repairing the old Banner shaft is in progress.

BEST AND BELCHER.—The winze below the 2500 level, joint with Gould and Curry, has passed through 15 ft of material containing some iron and other base metals. This formation was quite soft. The bottom of the winze is now in harder material. Not much water is yet encountered.

ALTA.—The partition placed in the main shaft gives a good circulation of air, and the work of putting in new guides and overhauling and repairing the cables is progressing well.

COMBINATION SHAFT.—The new hydraulic pump is probably completed by this time, and as soon as it is properly tested it will be shipped to this city and put in place.

ANDES.—The north drift is in quartz of fine appearance, but of low grade. In the north drift from the winze some ore of low grade is being obtained.

SIERRA NEVADA.—The upraise from the main north drift on the 2900 level is progressing at the rate of 15 ft per week.

YELLOW JACKET.—The usual amount of ore is being extracted and sent to the mills, and this amount can be increased as required. Considerable work in the way of explorations is being done.

CROWN POINT.—About the usual quantity of ore is being extracted and shipped to the mills on the river.

MEXICAN.—The main north drift on the 3100 level is within 10 or 15 ft of the Union Con. As soon as it reaches the line the drift will be taken by the latter company.

BELCHER.—Some ore is being extracted, and the amount will be gradually increased as additional stamps are put in operation in the mills on the Carson river.

UNION SHAFT.—It is still necessary to keep a certain number of men at work at cutting out behind and casing timbers at the 2300 station.

UTAH.—Good progress is making in east cross-cut No. 2 on the 1350 level, which is passing through ground of a favorable character.

CON. VIRGINIA.—The joint California winze on the 2700 level is being sunk and timbered at the rate of 10 ft per week.

IMPERIAL.—The west drift from the 600 station is being pushed as rapidly as possible for the works in the old upper levels.

CALIFORNIA.—The joint Con. Virginia winze on the 2700 level has been sunk and timbered about 10 ft.

OPHIR.—Are still extracting the usual amount of low-grade ore from the old fillings on the 150 level.

OVERMAN.—Some low-grade ore is still being extracted from the old upper levels.

Bernice District.

BOTHWELL MILL.—*Silver State*, Nov. 15: S. R. Young, of Lovelock, informs us that the suit brought against G. W. Bothwell of Bernice has been settled, and Mr. Bothwell has made arrangements with the mine owners to run his mill all winter. Bullion valued at $2,500, from the Botbwell mill, was received at Lovelock on Monday.

Belmont District.

BELMONT MINE.—*Courier*, Nov. 10: The prospects in the Belmont mine are brightening as the work of development advances. It is now believed that Superintendent Fassett has always been on the right track. It is now known that the Company has passed the north-end "horse," and that the mining experts who always claimed there was no more ore south of it were in error. Ore is where you find it, and not where experts would have it.

The following is a copy of the Superintendent's letter of Nov. 10: "No. 1 level in Laity ground is now 206 ft south of Highbridge shaft. Ledge widening and improving in appearance as we go south. Winze No. 1, 55 ft north of face, is down 25 ft and yielding splendid black metal and chlorides. All stopes in south tunnel and in Laity ground are yielding first-class ore, some of which assays up in the hundreds. Mill is doing splendid work; chlorinations averaging 91 per cent. Will commence bullion shipments to-morrow."

Candelaria District.

NORTHERN BELLE.—*True Fissure*, Nov. 10: The cross-cut on the fifth shaft level has been extended 10 ft, being now in a distance of 57 ft, and is showing a small streak of sulphurets in the face which gives assay as high as $225 per ton. The main cross-cut on the fourth shaft level has passed into a very hard slate formation. The progress in running for air connection is slow, the ground being exceedingly hard. A drift is being run on the old twelfth level to ascertain if the ore body found on the levels above extends that far downwards. Every thing in and about the mine is progressing smoothly. The total bullion shipment for the month of October amounted to $33,278.84.

COLUMBUS CON.—The west drift from cross-cut No. 1 remains about the same. The drift to the east from the same point has been extended 5 ft in mineral-bearing ground, some of which gives fair assays. The stope from the 150 level is yielding a considerable amount of high-grade ore. A considerable amount of ore has been taken out since the work of

extraction was resumed. The best of it is being sacked in the mine before it is hoisted to the surface, where it is stored.

MOUNT DIABLO.—The stope near winze No. 1 and below the third level is giving some $50 ore. The stope from lower winze No. 2. is yielding a little ore of fair grade, while that above the west drift on the third level is looking well and giving considerable $60 ore. There was a shipment of bullion amounting to $6,468.43 made on the 3d instant. This was the last shipment on October account, the total amount being $47,108.77.

THE GREAT SUIT.—Reno *Gazette*, Nov. 12: Perhaps no mining suit ever tried in this state has created more general interest than the suit that came up in the United States Circuit at Carson this morning, between the Northern Belle and Holmes mining companies. It involves a matter of $2,000,000 damages, claimed by the Holmes Co. An array of legal talent, the best in this state and California, have been secured, and the most noted experts in the whole country have visited both the mines at various times for the purpose of further enlightening the court, and the jury which will be impaneled. It is estimated that at least $200,000 have already been expended in the preparation of the case.

Eureka District.

ALEXANDRIA.—*Sentinel*, Nov. 15: The Diligent shaft on this mine is now down 250 ft, and will be carried to a further depth of 50 ft, when drifting will be commenced from that point. At present the work of development is slow, but when spring opens it will be pushed ahead rapidly. The new engine from San Francisco is working all right, and every thing about the place goes smoothly. Tributers are exploring the old works, and are pretty successful. One set at work on the Sterling tunnel has now about 12 tons of rich ore on the dump.

MINERAL HILL.—George Rives has started up the Christie mill at Mineral Hill on the Co.'s tailings, of which there are about 30,000 tons in the gulch. Mr. Rives says that he is working the stuff up to 60 per cent. R. D. Clarke will make a test of 50 tons of ore and tailings in the Bertrand mill, and if the experiment proves a success, the mill will be converted into leaching works at once, at a cost of about $15,000.

RICHMOND.—The Richmond mine, says the Eureka *Leader*, was last Saturday partially closed down, a few men only being kept on. The reason for this act on the part of the management is scarcity of ore on the upper levels, and too much water on the lower levels. The machinery will be started up as often as the tributers have ore to hoist.

Humboldt District.

HUMBOLDT QUEEN.—*Silver State*, Nov. 14: T. K. Stewart, who recently returned from a surveying expedition in Humboldt County, says the largest and richest quartz mine in the state is situated a few miles north of the old town of Limerick. He thinks the owners have at least $100,000 worth of ore now on their dump. The ore is gold-bearing, and what is considered unusual for that country, is free-milling and of uniform richness. The mine alluded to is the Humboldt Queen.

Pinto District.

NOTES.—Eureka *Sentinel*, Nov. 13: That portion of the Queen mine leased to Steve Bedell is turning out ore valued at $450 per ton. George Yerrick is preparing to resume work upon the Nahant mine, owned by George Hilkey and himself, and says that he will punch a hole through the mountain as fast as it is possible to do it. John Steel has for the time being, quit work at Newark to lease the Diagonal's tunnel. He will run that property for 2 years. James Berryman, Mark McGath and Richard Berryman, who have a tribute pitch in the Rescue mine, took out 200 sacks of rich ore yesterday from above the old Madden chamber. Bill Long and Hon. J. W. Smith have filled 100 sacks with ore from the old dump of the Silver Stone mine, and will ship the same to the furnaces at Eureka. The tributers to the Champion mine are taking out considerable ore. The vein is smaller than it has been, but the ore is very rich. The Champion is on the same ledge as the Fairplay. The miners of Pinto district are at a loss to know why the White Rose mine lies idle. It is situated directly between the Fairplay and Champion mines, and is on the same lode. It is owned by a Boston company.

Pioche District.

KINGFISHER.—*Record*, Nov. 10: The Kingfisher mine is greatly improving. The shaft is now down 45 ft below the tunnel level, and the ore enhances in value the deeper it gets. The last batch of assays J. C. Lynch had made, the ore being taken from the bottom of the shaft, showed an average of $107.50 in silver.

DRY VALLEY MILL.—The last bar of bullion that will be shipped by the Dry Valley mill arrived in town Wednesday, valued at $1,701. The mill was closed down, owing to the water freezing during the night. There are 50 tons of concentrations yet piled at the mill for shipment.

Tuscarora District.

NAVAJO.—*Times-Review*, Nov. 10: There is ore enough in the upper levels to keep the mill running steadily for a year, by which time the lower levels will be opened and prospected. The opening out of the 650 will develop 200 ft of virgin ground. The vein at the 450, the lowest point at which it has been prospected, is strong and well defined, with no indication of "petering." There is no reason for an inference that it does not continue its downward course or that it will not be encountered in the bottom cross-cut.

THE SIPHON.—*Times-Review*, Nov. 14: The siphon from the North Belle Isle sump to the Navajo is completed, and the water from the former is being drained into the latter, from whence it is raised to the surface by the pumps. The entire flow from these mines will be utilized at the Independent mill, which will start up to-morrow on Navajo ore. Both of the ore houses at the Navajo are full, and hauling to the mill commenced to-day. There is every indication that the ensuing run will be the longest and most successful ever yet made by the Navajo Co.

White Pine District.

SADIE L.—*News*, Nov. 10: Wm. Sheik, who was in from Aurum yesterday, informed us that a strike of great importance has been made in the Sadie L. mine. The ledge, he says, is 10 ft wide, the ore being carbonate and very rich. He is not sure it can be milled and may have to be smelted. This mine is destined to make a name for itself in the near future.

ARIZONA.

CONTENTION.—Tombstone *Epitaph*, Nov. 14: Mr. Thompson informed a reporter yesterday that the pumps would be throwing water by the first of December. Work has been much delayed by the non-arrival of machinery. When in complete running order, the Contention pumps will have a capacity of 700 gallons per minute. This added to that of the Grand Central pumps, about 400 per minute, will give a total of more than a million and a half gallons per day.

GOLD.—Prescott *Miner*, Nov. 8: Two years ago Fermin Mejia found near the old Senator mill, on the upper Hassayampa, 7 pounds of gold quartz ore, from which he extracted $414, calculating the gold at $18 per ounce. He exhibited to our gaze to-day a sample of ore which is fully one-half gold, and will pay at the least calculation $60,000 to $70,000 per ton. This is the finest gold discovery ever made in Arizona, and perhaps in the world. Mr. Mejia is carefully sacking the richest ore, while that worth from $2,000 to $3,000 per ton is left on the dump as second-class.

NOTES.—*Courier*, Nov. 12: Mr. Campbell, of the Oro Belle mine, Tiger district, is getting ready to arastra his gold rock, some of which is worth $1 a pound. Lane's silver mine, between the Tiger and Tip Top, is large and rich. It is tunnelled in a distance of 300 ft. The Peck mine is being worked systematically at a depth of several hundred ft from the surface. The Warrior, Mr. Eaman's mine, is in splendid condition. Eight tons of good ore are every day taken out. Most of this ore yields, when roasted and milled, 113 ounces of silver to the ton. Mr. J. J. Egbert, from Turkey Creek, informs us that there is great activity in that camp. Gallagher & Co. have found high-grade ores in their claim. F. Fulkerson, who is working the National, is in a large body of carbonate and galena ores. John Holmes, working the Homestake and Homesite mines, is taking out very rich ores. Gavin & Co. are working a full force on the Pine Springs.

PIONEER.—*Silver Belt*, Nov. 10: Both Howard & Pioneer mills are shipping their usual quantity of bullion. The South Pioneer shaft is down 400 ft, and they are drifting to reach the ledge, which will be completed in a month. The Pioneer shaft is now down 370 ft, and if they have the quantity of rich ore they are taking out of the winze they will have a bonanza.

SILVER KING.—Pinal *Drill*, Nov. 10: This company has changed superintendent. R. M. Phillips requested the directors to accept his resignation and to appoint Arthur Macy as his successor. Mr. Phillips has accomplished a mighty work during his time. Every department of the business has been reorganized and put in complete order. Rich specimens are more plentiful than ever. They come from the 714 level.

COLORADO.

SURPRISE.—Georgetown *Courier*, Nov. 8: The Surprise lode, on Keith Mountain, has from 1 to 10 inches ore, assaying from 20 ounces to 5,586 ounces silver per ton. The last named assay was made by Robert Neuman this week. The mine is opened by a shaft 70 ft deep, with 8 inches of ore in the bottom.

ONTARIO.—Idaho Springs *News*, Nov. 9: The Ontario Mining Co. paid its 88th dividend on the 15th ult., of 50 cents per share. Total amount of dividends paid, $5,000,000. A tunnel 5 by 7 ft in the clear, and 5,763 ft in length has just been completed, which will drain the mine to a depth of 600 ft.

SILVER PLUME.—Idaho Springs *Gazette*, Nov. 10: Last week John Davidson had a specimen assay on a sample of ore taken out of his prospect on McClellan Mountain, which gave 10,800 ounces of silver and all at grass roots.

IDAHO.

PHILADELPHIA SMELTING WORKS.—Wood River *Times*, Nov. 7: These, Supt. Moulton said, would run 40 days longer, when they would be shut down for the winter. Since the opening, the works have produced 213 car-loads of base bullion averaging 25,000 to 26,000 pounds to the car-load, and carrying an average of 250 ounces silver to the ton. With the remainder of this year's production the total will be increased to 300 car-loads. This will make a total of at least 7,500,000 pounds of bullion, worth in the neighborhood of $1,300,000, produced by the Philadelphia Co.'s works this season.

COLUMBIA AND BEAVER MILL.—The mill has run about 45 days, and during that time has turned out $60,000 worth of bullion. It was a pronounced success from the start. The company guarantee 90 per cent, but Supt. Chase, of the Silver King, upon whose ore the mill was running nearly all the time, says that it did much better than that.

BALTIMORE GROUP.—McGregor & Conner, who a few days ago sold the Allen group of mines, on Warm Spring Creek, to a syndicate of Leadville and Detroit capitalists, yesterday purchased the Baltimore group of 5 claims, situated on Baltimore Hill, 1 mile from the famous Elkhorn mine. The price paid for the property is $30,000.

INDEPENDENCE.—Six men are employed on the Independence mine, east of the Elkhorn. In the breast of the main tunnel, 50 ft in on the ledge, a 10-inch vein of fine dry ore has been struck, containing rich chlorides and sulphurets bearing native silver. The galena vein holds good, about 1 ft in width. The dry ore runs up to 342 ounces, and averages 200 ounces per ton. The Independence and Silver Bullion have both been leased by Popham Bros. to Reid Bros. to July 20, 1884.

BULLION.—Operations at Bullion are assuming winter conditions. Ninety-five men were discharged from the Bullion, and forty-five from the Jay Gould yesterday. It is rumored that forty-five more will be discharged from the remaining mines. This will leave but about one hundred miners in the camp during the winter.

GOLCONDA.—*World*, Nov. 9: There is a large quantity of high-grade ore on the dump, and much more that can be taken out without sinking. The Golconda is situated higher than any other mine in the country, the altitude being 8,000 ft. The ore is free-milling gold ore. The gold is worth $14 per ounce.

BANNER.—A seam struck the other day in the east drift of the Banner mine comes pretty near being the pure stuff. Assays of the ore ran over $21,000.

LEVIATHAN.—Challis *Messenger*, Nov. 6: This is on the mountain south of Bayhorse, and is owned by Wm. J. Scott and Al. Gay. There are three men at work and the outlook is flattering. In the upper or old workings they are working on a vein a foot thick of high-grade copper, and in the lower workings they have a body of the same class of ore one foot and a half thick. In the past two or three weeks there has been taken out and shipped 17,000 lbs. of ore which netted over $600, and there are between 5 and 10 tons of the same class of ore on the dumps.

THOMPSON CREEK.—Jack Kirk and Joe Soucy have purchased a one-third interest in the Davitt, Poor Man and Monday mines, on Thompson Creek, from Godfrey Gagnon for $2,500. These, although mines which were discovered only a few months ago, promise great things. They are large veins of good grade ore, and a number of tons have been shipped to the Bayhorse smelter, which gave good returns.

MONTANA.

MOUNTAIN VIEW.—*Inter-Mountain*, Nov. 10: Work progresses with uninterrupted activity. The face of the 300 ft south level is in ore which is improving in quality as the hanging wall is approached. At a depth of 500 ft the north cross-cut within the past few days, at a point about 20 ft from the shaft, has passed through 3 ft of copper ore.

WASHOE.—In the Washoe the hanging wall has been struck. The ledge is 14 ft wide and all in ore. Drifting on the vein has begun and the extraction of plenty of ore will soon be expected. The 200 north cross-cut is in 70 ft from the shaft, but the north vein has not yet been struck.

ALICE.—Butte *Miner*, Nov. 7: Day before yesterday the contract was let to drift 100 ft on the 800 level, from the bottom of the winze. This company disbursed $41,600 during the past month, the product for the month being $105,836.63 assay value. The amalgamations for the month average 89.55 per cent and the chlorinations 84.02 per cent.

GOLD FLINT.—This property was recently purchased by Wm. A. Clark. Drifting is being done east and west on the east shaft at a depth of 60 ft with good prospects. Fifty tons of ore have just been hauled to the mill. The ore is of high grade.

BELL.—They are driving west on the 400 level to strike the body of ore which was in the 300 ft in the old workings. The 400 ft extends 40 ft to the east and 100 ft to the west. About 20 men are at work.

CLARK'S COLUSA.—The vein has been cut in the cross-cut north from the 100 ft station. They are still sinking the shaft as rapidly as possible with three 8 hour shifts. From the drift from the old discovery shaft during the past week 6 car-loads of first and second class ore were shipped. The first-class ore went 63.9 per cent copper and the second-class 36.8 per cent.

NEPTUNE.—In the drift west from the new west shaft is a fine grade of ore, the vein being about 3 ft wide. This ore runs about 150 ounces in silver and $30 in gold. A large amount is being taken out.

A REPORTER'S NEW EXPERIENCE.—Mr. John L. Thomas, of the Baltimore *American*, was one of the newspaper reporters forming a portion of the Villard party, who visited Butte some time ago. In company with Mr. Hall, the superintendent of the Alice, they visited the 800 level. We quote him: "Mr. Hall with two of my companions left me for a walk to a drift beyond, and I remained with the man in charge of the pump. It was cold and wet and lonesome, and the 'pumpman' had a delightful way of entertaining a stranger that made me feel quite at home. Among other things he told me was that the pump was liable to stop at any minute, and the whole of the lower level be inundated before we could get relief, and that decomposed granite frequently fell in large masses, crushing every thing beneath and that a man had been killed just where I was sitting about 2 days before. No wonder that when Mr. Hall returned I pleaded earnestly to spend the night there. Our opinion is, that miners do not receive half enough pay for the risks they run to life and limb, and, although the pumpman was evidently guying a 'tenderfoot,' yet I am convined the safest spot inside of a mine is outside of it."

NEW MEXICO.

PYRAMID.—Silver City *Enterprise*, Nov. 9: This property, under new management, has taken on new life. There is now piled around the shaft-house of the Viola mine 3,000 tons of stuff, which will have to be assorted to get out the ore, the latter in all probability amounting to more than one-third of the whole. The company has already expended $200,000 upon their property, and expect to put out $50,000 more or prove their property a paying one before that sum is exhausted. In the hands of competent managers, there are no reasons why the mine and mill should not be brought to a paying basis. The ore in the dumps can be assorted to a value of about $80 on an average. Arrangements are complete for supplying the mill, which is a dry-crushing and amalgamating plant, with water sufficient for every purpose.

LAST CHANCE.—Ore shows throughout the levels of the mine, and from the stopes in the 50 and 100 levels there are 18 tons of ore hoisted daily. One-half of this is first-class ore and is shipped to the smelter at Benson, while the rest is piled on the ore dumps. Of this latter there are several thousand tons, which will be milled at some future time. There are immense reserves of low grade standing in the mine. The vein averages 4 ft between walls with ore filling it completely in most places.

STEEPLE ROCK.—Cor. of Silver City *Enterprise*: The camp is in a flourishing condition. Newcomers are arriving every day. All the claims that are being worked are showing up well. Work has been temporarily suspended on the Nugget, on account of the non-arrival of the whim. Grant and Williams are having some work done on the Little Emily. Campbell, Barton and McDonald are doing some work on the Eagle, with fair results. Barton and Johndrews will soon commence work on the Beecher. Cadwell, Brown and Sheehan will do 100 ft more work on the Rain-in-the-face this fall. Livingstone and Stonewall are working the Jersey Lily. They are getting out good ore. George Graven took out some very fine specimens of horn-silver from one of his claims last week.

NOTES.—*Southwest Sentinel*, Nov. 10: The Sherman mine has a splendid showing at present. Nearly 300 tons of good ore have been knocked down recently that will run 40 ounces per ton, and in the main drift the ore is 13 ft or more. The Old Man mine promises to be a veritable bonanza. Another rich pocket has been struck on the eastern side of the mountain that will prove more extensive than the one that yielded $30,000.

BONNIE JEAN.—Charles Fink reports that work on the Bonnie Jean mine at Shakespeare is down 273 ft, and the outlook is favorable. Sixty-five ft of cross-cutting at the 200-level shows up four distinct veins of spurs running in copper, silver and gold to the value of $61 per ton.

KINGSTON.—Deming *Tribune*, Nov. 8: From the Bullion mine, four car-loads a month are shipped to Denver. The last one, for which returns had been received, netted nearly $3,000. This mine has recently yielded some of the richest sulphide and most beautiful native silver specimens ever found in the territory. Some of the former has assayed as high as 90.45 per cent in silver, or more than $29,000 per ton.

OREGON.

TRUE BLUE.—Baker City *Tribune*, Oct. 30: F. M. Bishop, of Salt Lake, after assaying 2 sacks of the True Blue mine—an extension of the Black Maria—says that the Washington district "is a good country to stay with." One sack yielded at the rate of 1,516 ounces silver and 1,020 ounces gold; the other 1,902 ounces silver and 802 ounces in gold per ton.

UTAH.

ONTARIO.—Southern Utah *Times*, Nov. 10: The Ontario Silver Mining Co. paid its 88th dividend, amounting to $75,000, Oct. 31. This makes a total of $5,000,000 paid to date. The Ontario mine shipped for the week ending Oct. 3d, 19 bars of the value of $24,497.11. The total shipments for the year are about $1,500,000.

CARBONATE CAMP.—The hoisting works of the F. M. & S. Co., over the Rattler mine in Carbonate Camp, are finished and in perfect running order. The machinery is of the latest improved pattern, heavy and substantial in construction, and powerful enough to enable the company to sink almost any depth. The ore body in the mine is said to show up splendidly, and promises to prove a low-grade bonanza to its owners. The concentrating works are awaiting for the accumulation of water. Kirby, the manager, has his work so systematized that the daily reduction is made to average 14,000 pounds.

CAVE MINE.—Another valuable strike has been recently made in the Cave mine in Bradshaw district. The discovery consists of another cave, 200 ft long and upwards of 60 ft wide. The ore deposit in the strike is richer than ever. The Cave now ranks second among the ore-producing mines in Southern Utah.

WASHINGTON.

CŒUR D'ALENE.—Cor. of Virginia *Enterprise*, Nov. 14: J. M. Robinson writes from Eagle City: By a glance at any recent map the position of this camp with reference to the Northern Pacific railroad and the well known lakes Cœur d'Alene and Pen d'Oreille can be determined. The camp lies in the very heart of the Cœur d'Alene mountains, about 80 miles east of Fort Cœur d'Alene, and nearly an equal distance south of Lake Pen d'Oreille. Pritchard and Eagle creeks are the 2 streams at the confluence of which is Eagle City. The first named has been the better pospected. Its length from its source in the mountains to where it empties in Eagle is from 20 to 25 miles. It has been prospected, and claims located along it, for 12 miles above its mouth. But few of the claims have as yet been worked by competent miners, though some have proved very rich in course gold. The gold is principally found on and in the bedrock, although in some instances pay has been found in the gravel; and even in the hillside, fully 300 ft above the level of the valley, rich drift diggings have been opened. There prevails among the miners and all who have yet visited this region the opinion that it will soon take prominence among mining camps, and before another winter develop into a very rich camp. Many nuggets have been found weighing from half an ounce to two ounces or more, the largest yet taken out, to my knowledge, being a trifle over 7 ounces in weight. In addition to the rich placer diggings, I may say, in all truth, that this is the richest country for gold-bearing quartz that I have ever yet seen. The winters here are of long duration—having now set in—and snow falls until late in the spring. The average depth of snow is from 7 to 9 ft, and ingress or egress is impracticable except by means of snowshoes until about July 1. Rathdrum, Idaho, is the easiest of access from this camp. It is on the Northern Pacific railroad and the county seat of Kootenai county. I expect to spend the winter in San Francisco, and my address will be there after Nov. 15. Any further information cheerfully furnished.

A DAMPER.—Bodie *Free Press*, Nov. 13: John T. Kelley, a Wood River pioneer who left last June for the Cœur d'Alene fields, writes from that new country as follows: "The country is overrun with excitement, but at least one-half the immigration turns around and may be seen going out within ten days from its arrival. The stories I heard before coming here I have found to be generally magnified about ten times."

AN UNBELIEVER.—Salt Lake *Tribune*, Nov. 14: Frank McCarthy, an oldtime mountaineer, came down from Missoula yesterday, and in being interviewed said: "I think the Northern Pacific Railroad Co. is largely interested in getting up a stampede to the Cœur d'Alene. It is the policy of that Company to fill up the great Northwest rapidly with a population." * * * * "Then you think there is more smoke than fire in this hurrah?" "Decidedly; and railroad smoke at that."

The Butte (Montana) *Inter-Mountain* of the 7th gives Mr. George Odell's report: He does not advise a stampede to Pritchard Gulch this winter, though any man who has money and nothing to do might go there now, and before spring get interests in some good ground. Bedrock has not yet been reached in the gulch, and until it is struck, the future of the gulch can not be determined. Mr. Odell is of the impression that Pritchard Gulch will next spring be the scene of one of the most exciting stampedes ever known.

Cinchona Growing in California.

The best information on cinchona growing in this state emanates from the College of Agriculture at Berkeley, for the horticulturist of the institution, Mr. W. G. Klee, has for several years made the culture a special theme of study and experiment, and the results thereof are contained in the valuable reports made by Prof. Hilgard of the work done in his department. From the last report we compile the following information:

Three species of Cinchona, the Succirubra, Officinalis and Condaminea, growing on the experimental grounds at Berkeley, partially sheltered, received no apparent injury from the frost during the winter of 1881, while the Cinchona calisaya and the hybrid died. In the spring, however, Officinalis and Condaminea were attacked by a peculiar fungoid disease, a little above the ground, spreading in a few days, causing the stem to decay and killing the plants completely. This disease, we have learned, is quite common in the young plantations in India, often making great havoc there.

The only species, therefore, that survived in the open air was the Succirubra, which continued to grow remarkably well through the summer, receiving but three waterings. The early rains and preceding moist but mild weather seemed to agree perfectly with its nature, and it continued to grow all winter, and by the time our first severe frost, that occurred in the beginning of January, 1882, it stood about four feet high, with a handsome crown. The cold, which probably did not go below 26°, killed it to the ground, and although it again has made a start from the root, the shoot is too tender to withstand any frost. Owing to our supply being so very limited, we have not thought it wise to try any more plants in this locality in outdoor culture. The first distribution was made at the end of April, 1881, when the severe frosts of the season were supposed to have passed. Plants were sent to twelve different persons (who previously had applied for them), living in ten different localities, situated in seven distinct counties, as follows: Fruitvale, Alameda County; Martinez, Contra Costa County; Rohnerville, Humbolt County; College City, Colusa County; Nordhoff, Ventura County; Carpinteria, Santa Barbara County; a location near San Gabriel, Los Angeles County; and Santa Rosa Island, in Santa Barbara Bay, besides a few plants scattered over Oakland and Berkeley. The plants were all carefully packed in boxes, and each plant in a pot, nearly all being shipped by express.

In June, 1882, a letter of inquiry was sent to each person having received cinchona trees, submitting the following questions:

Character of soil in which planted? Exposure of location? Condition of trees when received? Condition and size now? Amount of irrigation, if any used, and how late in the season applied? If dead, what was the probable cause? If killed by frost, at what time did it occur? If possible, give the exact temperature at which they succumbed, and also the atmospheric condition at the time, whether moist or dry.

Direct or indirect answers have been received from eight of the persons to whom inquiries were sent, some of whom were very careful and painstaking. It appears from these, that in all but two cases the plants arrived in splendid condition; that the soil selected for them was well drained, ranging from a gravelly, heavy loam to a lighter soil, rich in humus. In all the northern counties, as also in Ventura County, they grew fairly until the occurrence of frosts, when they were killed to the ground (temperature and atmospheric condition not observed), the only exception to this being the locality back of Fruitvale, where one is still living. In the southern counties, also, all but one died. The fact is attributed to various causes; in one case it is given as too hot, while in another, at Carpinteria, the failure of two of the plants is not definitely known to be due to frosts. From this locality, however, we have the report of the only surviving tree of the whole lot; but as it was partially protected, we are still in the dark as to the practical significance of the fact. Unfortunately, the most promising locality, perhaps, Santa Rosa Island, remained actually untried, the plants suffering permanent injury during the voyage from Santa Barbara. Such was also the case with the lot sent to a very sheltered locality in the San Gabriel Valley, Sierra Madre Villa, where the Chirimoya apple is flourishing.

To draw any definite conclusions from these scanty experiments alone seems to be premature; but comparing them with our own observations, and also with the Australian and Indian experiences, as stated in their respective reports, we venture the opinion that these particularly well sheltered locations, subject only to very light frosts, found here and there in the so-called warm belts in a number of counties, may, by careful cultivation and attention, be made to grow the red bark tree (C. succirubra), and the still hardier variety, C. pitayensis (not yet grown here). Whether the cultivation of the tree would repay all the trouble necessarily attending it it is difficult to say, when we consider that the price of quinine no doubtedly must be greatly reduced when the enormous plantations in India, Ceylon and Java, growing in perfectly adapted locations, come into full bearing; nevertheless, it seems a pity that the subject should be dropped altogether without arriving at definite conclusions. We have still on hand a limited stock of plants which could be utilized if the proper appliances for their propagation could be afforded. Without this they will gradually be lost. It must be remembered that our experiments here with the Cinchonas has been of comparatively little expense to the state, having been made in conjunction with other plants, and in the same house, while the seed was a donation. A small appropriation—say of $1,000—would enable us to erect the necessary additional building, and to increase the stock enough to supply such localities as our previous experience has taught us to be favorable.

Cobalt.

Occurrences.

Cobalt in the United States is found associated with the ores of nickel, sometimes with those of copper. At Silver Islet the mineral macfarlanite, found with the silver ores, yields a small percentage of cobalt. In Missouri, at Mine la Motte and at the Saint Joe lead mines, nickel and cobalt-bearing minerals are found associated with the galena, the nickel in the form of millerite, with a small amount of cobalt, and the cobalt as siegenite, in brilliant octahedral crystals. At the Gap mine, in Lancaster County, Pennsylvania, cobalt is found replacing part of the iron in the pyrrbotite; the percentage is exceedingly small, and the ore could not be worked for cobalt alone. Smaltite occurs in Gunnison County, Colorado, at the mines of the Sterling Mining Company, an analysis by Dr. M. W. Iles showing 11.59 per cent of cobalt. Some of the copper ores of Western Nevada are also reported to contain cobalt; and it is found in traces in many of the iron ores of Penusylvania and Virginia. The speiss formed in smelting certain Utah lead ores also contains appreciable quantities of cobalt. Other occurrences of cobalt minerals are cited in the preceding paper on nickel, by Prof. W. P. Blake.

No American ore is worked for cobalt alone, the small amount produced being obtained as a by-product in the reduction of the nickel ores of the Gap mine. These ores are smelted to a matte at the mine, which is further treated at the Camden Nickel Works, and the small amount of cobalt obtained is worked up into oxide. At Mine la Motte the cobalt is obtained in a matte produced in smelting the lead ores, the matte being shipped to England and Germany for reduction.

Domestic Manufactures.

The production of cobalt oxide in the United States is very limited, and, so far as can be learned, no other preparation of the metal is produced. Until recently, all that was used was imported, and now the oxide is only produced incidentally in the reduction of the nickel ores of the Gap mine in Pennsylvania.

Small amounts of the carbonate, chloride and nitrate are produced in this country by chemical manufacturers, the crude material, in the form of oxide, being obtained from abroad. The principal cobalt preparations imported are the oxide, smalt, and zaffre. The last is generally an impure oxide, produced by simply roasting the ore. Smalt is the ground product of a fusion of the oxide (or of zaffre) with quartz sand and potash.

Imports.

It is difficult to get at the exact amount of cobalt preparations imported, as in many cases the weights of packages are not given. The following table gives the number of packages and some of the weights of packages entered at the port of New York in the years 1881 and 1882, and up to May 9, 1883, as published by the *Oil, Paint and Drug Reporter*, of New York City:

If the average weight of the packages for each year be taken, and that weight be assumed the weight of the unweighed packages, the probable amounts imported through the port of New York were as follows:

	1881. Pounds.	1882. Pounds.	1883, to May 9 Pounds.
Cobalt, metallic	9,079	8,103	.....
Cobalt oxide	6,334	7,485	5,540
Smalt	13,224	14,495	13,380
Zaffre	1,887	2,280	633

In the annual report of the Chief of the Bureau of Statistics for the year ending June 30, 1882, the importation of cobalt oxide is stated as follows:

	1881.		1882.	
	Pounds.	Value.	Pounds.	Value.
Cobalt oxide	21,844	$13,837	17,758	$12,764

It is very probable that the amounts of oxide, smalt, and possibly zaffre, are combined in this statement, as the value per pound would be for 1881 63 cents, and for 1882 71 cents, while the quotation of oxide for the year 1882 was $2.65. Smalt is quoted in two grades, the first at 13 cents, the second at 8 cents per pound, and no distinction is made as to grade or class in the reports mentioned. Chemically pure metallic cobalt is quoted in New York at $14 per pound retail. The probabilities are that only a small percentage of the amount given was pure metal, and no figures can be had as to its value.

Production in 1882.

The home production of cobalt oxide, as already stated, is very limited, the production of the Camden works for the year 1882 amounting to 11,653 pounds, valued at a little less than $3 per pound wholesale. The production of the Saint Joe mines has not been ascertained. The value of the nickel and cobalt in the matte from Mine la Motte for the year 1882 was $12,500, but the proportion of cobalt to nickel is not stated.

The uses of cobalt and its compounds are limited. In the metallic form cobalt is used chiefly for experimental purposes. Experiments have been made in England on the substitution of cobalt for nickel in electro-plating, and it is said with some success. The demand for the oxide, smalt and zaffre comes from the glass manufacturers and potters, the oxide and smalt being largely used in the manufacture of blue glass, and more extensively by potters to correct the yellow tint of the ware, as well as in the production of blue ware and in ornamentation. Smalt was formerly used in the manufacture of paper, to neutralize the yellow tint, and in blue ruling, but its extreme hardness proved a serious drawback to its use for that purpose.—*F. W. Taylor, in Mineral Resources of U. S.*

The Cœur d'Alene Placers.

A correspondent writes to the *Oregonian* from Eagle City, I. T., on the 31st ultimo: I send you the latest news from the gold fields. They are beyond doubt the richest diggings discovered in the past twenty years, nuggets being taken out the size of hen eggs, and claims are being jumped every day. Gold quartz leads have been discovered that will astonish the old '49ers. One lead was found last week which is being guarded by armed men both day and night, as every piece of quartz brought to the surface shows the gold plain to the naked eye. A saw mill is needed, as also new stocks of provisions, but the drawback is limited transportation from the post Cœur d'Alene, which is the nearest supply depot. There is only one steamboat plying on the lake, and that belongs to the government. There is work for at least three steamboats. A good opportunity is presented for a store or two in the town of Cœur d'Alene, through which every miner has to pass. The only store is the post trader's, and there is no other store within twelve miles. It is certain that thousands of men will flock to the new El Dorado next spring. Pack trains are flocking in every day. The trail from the wagon road is good. Parties leaving here reach the post in two days. The officers and crew of the government boat are very courteous and obliging, and any body lucky enough to secure passage on the boat will never regret it. Those who are left have to take teams over the Mullan road, and must stop over several times on the route. The first place after leaving the town of Cœur d'Alene is Wolf Lodge, where there are ample supplies for man and beast. The next place is the Mission, where one may have to wait on account of the large crowds arriving there by steamboat. You then strike Mud Prairie, where a store is located. A night's stop is made at Doc. Masterson's, at the foot of the trail, where you get your last square meal, and hay and oats for your horses. I should advise miners to bring along a saddle, as horses can be had, but no saddles. From Masterson's the Indians take you into camp for $6, and your provisions for $4 per 100 pounds.

Boys Learning Trades.

Dr. Frances A. Walker, the efficient and enthusiastic head of the Boston Institute of Technology, is reported to be doing excellent work in the way of inducing many of the boys of that city to become mechanics. The tendency of boys generally in this country, especially during the last twenty-five years, has been in favor of adopting one or the other of what is called the learned professions, and the result already reached is, that with the exception of the clergy the learned professions are all overcrowded, and the law and medicine, which, in the country's earlier days, were broad, straight roads to honor and wealth, are no longer so; indeed, it is only in exceptional cases that they are not the narrowest, crookedest, roughest and longest roads of all to fame or riches. They are filled to overflowing with young men of fair ability, struggling desperately for the bare necessaries of life. But the places which technically educated mechanics should fill are generally empty, for mechanics is not considered a profession, and our boys have preferred failure in a profession to success in the workshop. If Dr. Walker or any other teacher can convince them that mechanics is a certain road to prosperity, and can induce our boys to take to it, he is one of the greatest of public benefactors.

Mechanics is just such a road in this country, which is teeming with all sorts of material to be manufactured. It is the highest technical education that is required for the proper development of this great mass of natural wealth, and the mechanics who have that sort of education will for many years find the way to success an easy one. Such a mechanic need not work with his hands, but with his brains; plan schemes, invent and improve machinery, manufactories, railroads, mines, furnaces and forges, and all that results through labor from them. The learned master-mechanic must long be in America the most needed because the most useful of its citizens. That is inevitable when there is so much mechanical work to be planned and done.—*Philadelphia Inquirer.*

COPPER loses strength rapidly with heat; from zero to 212 degrees it loses about five per cent, while at 550 degrees it looses twenty-five per cent.

Recent Contributions to the California State Mining Bureau.

[Furnished for publication in the MINING AND SCIENTIFIC PRESS by HENRY G. HANKS, State Mineralogist.]

[CATALOGUE.]

5024. Root of Buckeye, bearing a resemblance to the human form—El Dorado county, Cal. E. W. Hulford.

5025. Silver Ore, breccia coated with embolite—Alhambra mine, Unico mining district, San Bernardino county, Cal. Hon. John Daggett.

5026 Chrysocalla, silicate of copper—Copper World mine, Clark's mining district, San Bernardino county, Cal. Lowry Silver.

5027. Rock with Barite—Copper World mine, Clark's mining district, San Bernardino county, Cal. Lowry Silver.

5028. Copper Ore—Copper World mine, Clark's mining district, San Bernardino county, Cal. Lowry Silver.

5029. Alabaster, gypsum—Colima, Mexico. A beautiful ornamental stone. Williams & Blanchard

5030. Alabaster in which sulphur is imbedded—Colima Mexico. Williams & Blanchard.

5031. Auriferous Quartz—Gold Mountain mine, near Jamestown, Tuolumne county, Cal. L. de'Begon.

5032. Auriferous Quartz—Gold Mountain mine, 400-foot level, near Jamestown, Tuolumne county, Cal. L. de'Begon.

5033. Auriferous Quartz—Gold Mountain mine, 600-foot level, near Jamestown, Tuolumne county, Cal. L de'Begon.

5034. Auriferous Quartz—Gold Mountain mine, 850-foot level, near Jamestown, Tuolumne county, Cal. L. de'Begon.

5035. Wall Rock, footwall—Gold Mountain mine, near Jamestown, Tuolumne county, Cal. L. de'Begon.

5036. Wall Rock, hanging wall—Gold Mountain mine, near Jamestown, Tuolumne county, Cal. L. de'Begon.

5037. Gold Quartz—Hidden Treasure mine, near Murphys, Calaveras county, Cal.

5038. Copper Ore, red ore—Illinois mine, near Luning, Esmeralda county, Nev. J. H. Crossman.

5039. Copper Ore—Jumbo mine; "Jumbo Ore," "Black Oxide"—Sweet Vengeance mine, Santa Fe district, Esmeralda county, Nev. J. H. Crossman.

5040. Copper Ore, Jumbo Ore, Green Carbonate Ore—Sweet Vengeance mine, Santa Fe district, Esmeralda county, Nev. J. H. Crossman.

5041. Limestone, footwall—Illinois mine, near Luning, Esmeralda county, Nev. J. H Crossman.

5042. Wall Rock, hanging wall Illinois mine, near Luning, Esmeralda county, Nev.

5043. Red Jasper—Creek bed, near Windsor, Sonoma county, Cal. George Balser.

5044. Massive Quartz—Douglas county, Ogn. J. W. Cain.

5045. Brown Lignite, 5-foot vein (?)—Temescal mountains, 25 miles southwesterly of Colton, San Bernardino county, Cal. Owned by McIntosh & Chaney. Presented by Wm. H. Mintzer. Fixed carbon, 27.74; combustible matter, 32.26; water, 20.00; ash, 20.00; total, 100.00.

5046. Gypsum, selenite—Silver Peak, Esmeralda county, Nev. W. H. Stanley.

5047. Solid Quartz—Dover mine, Humbug canyon, Placer county, Cal.

5048. Silver Ore—Southern Nevada mine, Bellville, Esmeralda county, Nev.

5049. Silver Ore—Lizzie mine, west drift, Ivanpah, San Bernardino county, Cal. Capt. Battersby.

5050. Dolomite—Inyo county, Cal. W. H. Holt.

5051. Gold Ore—Monticello mine, Sulphur creek, Colusa county, Cal. Wm. Cherry.

5052. Pyrolusite, impure—Three miles from Railroad Flat, Calaveras county, Cal. M. H. Peck.

5053. Ore Containing Free Gold Manzanita mine, Sulphur creek, Colusa county, Cal. Dr. G. B. Hughes.

5054. Ore from the Silver Lead mine, Hornitos, Mariposa county, Cal. A. B. Rowley.

5055. Gold Sulphuret Ore Mountain mine, Nevada City, Nevada county, Cal.

5056. Silver Ore—Golden Crown mine, Prescott district, Bloody canyon, Mono county, Cal. Formerly known as the Antimony mine.

5057. Liquid Asphaltum From a natural well, said to be 100 feet deep, from which it overflows and becomes solid asphaltum—Steel's ranch, San Luis Obispo county, Cal.

5058. Solid Asphaltum from a natural well (see No. 5057)—Steel's ranch, San Luis Obispo county, Cal.

5059. Auriferous Quartz—Idaho mine, Gra s Valley, Nevada county, Cal. Ordinary ore. (See No. 1399.)

5 60. Cement with Gold—Godfrey gravel mine, Grass Valley, Nevada county, Cal. W. C. Stokes.

5061. Silver Ore—Mammoth mine, Lake district, Mono county, Cal.

5062. Silver Ore with Energite Tarshish mine, Monitor district, Alpine county, Cal. Geo. F. Beardsley.

5063. Silver-Gold Ore Valentine mine, Old Coso, Inyo county, Cal.

Mr. Ruskin's Museum.

A correspondent calls attention in a Sheffield paper to the prolonged delay attending the proposed enlargement of Mr. Ruskin's museum, in regard to which eight years have been suffered to pass and nothing done. Mr. Ruskin has himself superintended and had scaffolds erected around the Ducal Palace, Venice, to take casts of the sculpture; also from the cathedrals of Rouen and Amiens, the casts of which are in the storehouse of St. George at Walkley. He keeps two artists constantly employed making drawings from the best continental examples of old masters' work. These drawings, done especially for the museum for the Sheffield people, are dispersed up and down the country. Many are at the Whitelands College, Chelsea, awaiting room at Sheffield. A valuable collection is in the Nottingham Museum, also awaiting a suitable home. The finest collection of ambers, sixty odd pieces in all, are at Mr. Dallinger's College, also hidden out of sight, because there is not room at Walkley to display them. There are coins wrapped up in silver paper, better examples than those in the British Musuem, and lovely specimens of stuffed birds presented by Dr. Hewitson, of Leeds, are still in Leeds, waiting for a home. Most charming patterns for designers and china painters, bought from the famous Eyton collection, for which Mr. Ruskin gave £500, are unused because there is no room to display them, and Mr. Ruskin is waiting to know what the people of Sheffield are going to do before he begins to arrange them systematically. He wrote to say he had "van-loads more of books and things ready to come when there is a suitable home for them," and he had enough material in his home at Brantwoods, in the Lakes, to cover the whole of the Walkley Museum. Yet up to the present time the Sheffield people have only subscribed £45 towards providing a suitable building.

NORTHERN BELLE.—The Holmes-Northern Belle mining suit has commenced at Carson. Holmes claims $2,000,000 for trespass, and the defense claims prior location and the purchase of the ground. There is also a joint issue on the two ledge theory. The Northern Belle contends that it has not worked outside of its own vein; that there is no connection to prove that there is or was any valuable ore body in the ground claimed by the Holmes, and that any ground which plaintiff alleges was trespassed on is the property of the defendant,

Hoisting Apparatus for Wagon Derrick.

Byron Jackson, of this city, manufacturer of agricultural machinery, has attained some distinction as an inventor and designer as well as manufacturer. He has turned his attention mainly to harvesting appliances, and is the inventor of the well known derrick fork so largely used on the Coast. Mr. Jackson and G. W. Bonds have lately patented through the MINING AND SCIENTIFIC PRESS Patent Agency a hoisting apparatus for wagon derricks, a description of which will be of interest.

The hoisting drums are suitably placed on the wagon, and there are two friction wheels, one fixed to each drum, so as to give a greater amount of power than when but one wheel is employed for each drum. A shaft passes loosely through the wheels and drums, so that they may turn upon it, and the ends of this shaft have eccentric journals turned upon them. These journals fit into stationary boxes on the frame, and levers are connected with the shaft so they may be turned around to any desired position in their boxes.

The driving shaft extends across the frame at one side and has friction wheels corresponding with the other friction wheels on the drums. When the eccentric shaft of either of the drums is turned in one direction it will carry the friction wheel forward in contact with the others, so they and the drums will be caused to rotate as long as contact is maintained, and the forks will then be lifted, and when by a reverse movement of the lever the eccentric shaft has been turned in the opposite direction, the friction wheels being no longer in contact, the drums will stop rotating. The forks may be held at any point when elevated, until it is desired to drop their load, by brakes operated by foot levers. Suitable adjusting arrangements are provided to give the same amount of frictional contact to the wheels at opposite ends of the drum.

The friction wheel shaft has a gear on it which engages with a bevel pinion on top of a vertical shaft, which has a horizontal rope pulley secured to its lowest end, at a point so low that the rope passing around it is close to the ground and out of the way of the other mechanism or parts of the wagon.

By reason of the horizontal position of this rope pulley, the driving rope or belt can be brought to it from any direction, and it will not be necessary to set the wagon exactly with reference to the engine or other power, but only so that the feeder belts will be in the best position from the wagon to the thrasher.

The engine being set with reference to the thrasher, so that the main driving belt passes properly from one to the other, the two parts of the rope are carried around the corner-turn idler-pulleys, and are led thence to the driving pulleys on the engine or driving shaft. The idler-pulleys are mounted loosely on a vertical shaft having a plate on the lower end, which rests on the ground. The pulleys are a short distance apart, the upper being smaller than the lower, so if the rope sags between them and the driver the parts will not chafe each other, as they will not be in vertical line. The shaft carrying the idler-pulleys is journaled in a light horizontal frame fixed to a stake or other anchorage. By drawing the pulleys back with a tackle the proper tension is given to the driving ropes. Provision is also made for automatically taking up any slack of the rope due to stretching after the machine is once set.

The Grizzly Quartz Mine.

This old mine, situated near Pike City, in the southwestern corner of Sierra County, is now being reopened by direction of the present owner, Miles I'Anson, of Newark, New Jersey, formerly of Sierra County.

The above-named, it will be remembered, while exploiting the noted Alaska mine (a lode contiguous to the Grizzly) some years since, discovered the rich central pay shoot which yielded such bounteous dividends to the original Alaska Company, and he is sanguine of even better success in the adjoining mine.

The Grizzly was originally located in 1854, by some miners who found surpassingly rich quartz in the croppings, from which several thousand dollars were crushed out by hand-mortar in a few hours. At various times subsequently it has yielded rich specimen quartz, the gold of which was exceedingly massive; but the bulk of the vein is a milling ore of excellent grade, carrying fine, free gold and oxydized sulphurets extremely rich in the precious metal. Astouishing "pan prospects" may be obtained anywhere aloug the walls and decomposed parts in the upper tunnel, where some 500 tons of quartz are cut and ready for stoping out.

A working and drain adit is now being driven from Texas Ravine, which will tap the lode at considerable depth beneath the upper works.

STEEL BELTING is, according to report, now being made in Germany. The belts are made exclusively of steel wire, and are so constructed that they are flexible, easily fastened, and may be tightened at pleasure. The pulley upon which the belting runs must be covered with leather or other suitable material for securing the necessary amount of adhesion. The belting is well adapted for heavy work, it is claimed, and is not affected by dampness or a change of emperature, as is leather.

USEFUL INFORMATION.

How Paper Gas-Pipes are Made.

Paper gaspipes are made by passing an endless strip of hemp paper, the width of which equals the length of the tube, through a bath of melted asphalt, and then rolling it tightly and smoothly on a core, to give the required diameter. When the number of layers thus rolled is sufficient to give the desired thickness, the tube is strongly compressed, the outside sprinkled with fine sand, and the whole cooled in water. When cool the core is drawn out and the inside served with a waterproofing composition. In addition to being absolutely tight and smooth, and much cheaper than iron, these pipes have great strength, for when the sides are scarcely three-fifths of an inch thick they will withstand a pressure of more than fifteen atmospheres. If buried underground, they will not be broken by settlement nor when violently shaken or jarred. The material being a bad conductor of heat, the pipes do not readily freeze.

COMPARATIVE WEALTH OF GREAT BRITAIN AND THE UNITED STATES.—Statisticians have pronounced the United States to be not only potentially but actually richer than the United Kingdom. Counting the houses, furniture, manufactures, railways, shipping, bullion, lands, cattle, crops, investments and roads, it is estimated that there is a grand total in the United States of $49,770,000,000. Great Britain is credited with something less than $40,000,000,000, or nearly $10,000,000,000 less than the United States. The wealth per inhabitant in Great Britain is estimated at $1,160, and in the United States at $995. With regard to the remuneration of labor, assuming the produce of labor to be 100, in Great Britain 56 parts go to the laborer, 21 to capital, and 23 to government. In France 41 parts go to labor, 36 to capital, and 23 to government. In the United States 72 parts go to labor, 23 to capital, and 5 to government.—*Iron.*

PAINT COMPOUND.—A new paint compound has recently been produced. The object is the production of a liquid mixed paint which is cheap to manufacture, will dry fast and with a hard finish, easy to work and not liable to crack or peel, covers a larger surface than lead and oil alone would do, will retain its color, or not turn yellow, as ordinary paint does, when used on the inside of buildings, and will penetrate most surfaces, including wood and iron, and prevent decay. The composition consists, first, in a certain liquid compound for the body of the paint, and secondly, in a body compound for mixture with the other, the two being combined so as to form a liquid mixed paint. The liquid compound has for its ingredients boiled linseed oil mixed with silicate of soda, naphtha mixed with alum, a potash solution formed by dissolving chloride of calcium in water, raw linseed oil, and resin and cod-liver oil mixed with brown Japan.

THE USE OF BISMUTH.—In England the use of bismuth has been patented in a new alloy containing copper, zinc, nickel, tin and bismuth in varying proportions. The so-called bismuth bronze is a hard, tough and sonorous metallic alloy, which is claimed to be especially adapted for the following purposes: For propeller blades, shafts and other appliances exposed to sea water; for telegraph wires, its toughness making it invaluable where much strain has to be endured; for piano and other music wires, on account of its sonorous quality; and for domestic utensils and other articles exposed to atmospheric influence, aluminum being added to the composition when intended for these articles.

SWELLED RIFLE BARRELS.—A Board of Officers, with Capt. Greer as President, has tested a lot of rifles at the Springfield armory to determine the cause of the bulging of the barrel which occasionally occurs in practice. They find it due to the fact that the muzzle has been stopped by sand, caused by resting the muzzle in wet sand, or in dry sand after the gun has become foul from firing. This arrests the passage of the ball, so that the pressure is increased at the point of swelling. It is curious that sand produced this result where wooden plugs, driven in tightly and swelled by steam, failed to do so.

WATER IN TIMBER.—The amount of water present in freshly cut wood is very different as is shown by the following table by Scheubler and Hartig: Hornbeam contains 18.6 per cent of water; willow, 26 per cent; ash, 28.7 per cent; birch, 30.8 per cent; oak, 34.7 per cent; pine, 39.7 per cent; red beech, 39.7 per cent; elm, 44.5 per cent; larch, 48.6 per cent; and white popular, 50.6 per cent. Wood, when dried at 266° F., at which temperature all of the hygroscopic water is expelled, is composed of 50 parts carbon (inclusive of one part of ash) and 50 parts of chemicals.

EARLY HISTORY OF THE AIR PUMP.—If it is difficult to decide who invented the telephone, one of the most recent inventions, how much more difficult it must be to ascertain the date of the discovery of the air pump more than two centuries ago. Gerlandt contributes a paper on this subject to Wiedermann's *Annalen*, in which he says that only this much can be established with certainty in regard to the date of its discovery, namely, that it was prior to the middle of August, 1652. Boyle invented the transparent receiver with movable cover; Huyghens, the air pump plate; Huyghens and Papin, the barometer test (manometer for low pressure); Papin, the doubly perforated cock, the use of two barrels, and the valves; but the latter were used by Sturm.

A HOME-MADE FOUNTAIN PEN.—Take two ordinary steel pens of the same pattern and insert them in the common holder. The inner pen will be the writing pen. Between this and the outer pen will be held a supply of ink, when they are once dipped into the inkstand, that will last to write several pages of manuscript. It is not necessary that the points of the two pens should be very near together, but if the flow of ink is not rapid enough the points may be brought nearer by a bit of thread or a minute rubber band.

MACHINERY VS. HAND LABOR.—The *American Machinist* says that a machine firm in Philadelphia was recently asked to construct a small machine which had just been invented. It did the work in good shape, but necessarily by hand labor, and found the cost nearly $200. It then undertook to manufacture the machine for $10 each by the use of especially constructed machinery, when an order for $1,000 was given. This is an example of the reduction of first cost by systematic manufacturing processes.

WIRE-DRAWING.—It was not until some time after 1300 that wire-drawing became an art. A race of wire-drawers, who made iron wires by hand and afterward by water power, then sprang up in Germany, and became famous in Europe. Wire-making was introduced in England about the middle of the fifteenth century. This industry was commenced in the United States at the beginning of the present century, and it is needless to say that it has grown into enormous proportions within the past few years.

HOW TO make a rat-tail file that will cut faster and last much longer than any cut-file ever made: Draw out a piece of steel to the size you want the file to be. Make it square and tapering to a point at one end; then twist it like any auger, but closer; heat it to a dull red, and chill it in water, dipping it straight down. Draw but little temper. You will be surprised to find how fast it will cut and how long it will last. The *Blacksmith and Wheelwright* is authority for the above.

AMERICAN IRON BRIDGES.—The Mexican Central officials complain of the iron bridges made for the road in England, and seem determined to have all future orders executed in the United States. The American bridges are lighter, while as strong, and of superior construction. What tells against English bridges are the exasperating delays. In America orders are filled promptly.

UNSAFE LUBRICATING OILS.—According to a writer in a contemporary, animal oils are unsafe to use in air compressors, as they take fire spontaneously in compressed air, or, in other words, they create an explosive gas.

GOOD HEALTH.

Change of Location for Health.

Change of location for invalids, says the *Journal of Health*, is an important curative element of itself, without reference to change of climate. As a rule, persons who have contracted diseases while residing near the sea receive the most marked benefit by changing their residence to a location "inland," and beyond the influence of the salt air; on the contrary, people who reside inland, when health fails, are benefited by changing their residence to some point near the sea. This is most marked in diseases of the throat, and in less degree in diseases of the chest; but then in almost all diseases benefit is derived from a change of location, whether it be a point more or one less salubrious than the place of departure. Now, we believe that climate changes have, ordinarily, very little to do with it, and that the improved condition is almost wholly due to pleasurable emotions excited in the mind by the new scenes and incidents which interest it and keep it occupied. This fact is an illustration of the power of the mind over the body. We see this power displayed in every act of our lives. What is called "moral force" is supreme; properly directed it would eliminate more than half the ills of life; but let the mind become chained to an idea, and all the skill of medical men is often powerless against it. Let a patient be thoroughly convinced that he is the victim of a fatal disease, and if in due time he is not convinced to the contrary, be may bring the disease upon himself or die from fears that—too late—have proved groundless. We would not discourage the use of medicines where their employment is plainly indicated, but there are thousands who are suffering from ailments that can not well be defined, and which affect both mind and body. The remedy is change. Go! no matter where. Do! no matter what, so long as it is worthy. In our opinion, the great mass of semi-invalids simply need a thorough shaking up. Give the immortal mind something better and nobler to do than to be constantly occupied with troubles that are imaginary.

Home the Best Place for Invalids.

The N. Y. *Sun* compiles from the *Continent* the views of a physician about the curative powers of nature, in which opinions are expressed somewhat different from the above. The physician concludes that it is better for a consumptive to stay at home, where he can be comfortable, than subject himself to the discomfort of hotel life, or to the greater inconvenience of a camp. He says that the camp cure may be fairly tried by sleeping on one's own house-top. Another medical man replies that the summer conditions of spruce forests are eminently favorable, and consumptives have recovered in the most surprising way living under canvas in them, where the air is impregnated with the healing emanations peculiar to the non-deciduous tree growths. There are consumptives whose lungs crave the salt air of the ocean; others to whom the dry atmosphere of Colorado is infinitely soothing; and others again who are benefited by the climate of Florida or Southern California. "To prescribe Florida for one person might mean death, while if he went among the northern paradise of spruce, recovery might follow."

DEATH FROM PASSION.—Cases in which death results from the physical excitement consequent on mental passion are, according to the *Lancet*, not uncommon. A recent instance has again called attention to the matter. Unfortunately, those persons who are prone to sudden and overwhelming outbursts of ill-temper do not, as a rule, recognize their propensity or realize the perils to which it exposes them; while the stupid idea that such deaths as occur in passion, and which are directly caused by it, ought to be ascribed to "the visitation of God," tends to divert attention from the common-sense lesson which such deaths should teach. It is most unwise to allow the mind to excite the brain and body to such extent as to endanger life itself. We do not sufficiently appreciate the need and value of mental discipline as a corrective of bad habits and a preventive of disturbances by which happiness and life itself are too often jeopardized.

THE WATER CRESS.—Dr. Grelletz, of Vichy, brought before the Therapeutical Society (*Bulletin*, June 30), the question whether this popular article of diet possesses any of the depurative qualities popularly attributed to it. He is of opinion that it does not, and that it is indigestible to most stomachs. It has acquired an undeserved reputation, and may be mischievous in the various forms of dyspepsia. He recommends its being prepared for the table in the same way as spinach, when it is easily digested and of a pleasant taste, or the cress may be carefully washed, cut up into small pieces, and then submitted to a press in order that its juice may be expressed. This is a little acrid, but may be corrected by syrup of bitter oranges or of horseradish, when it is beneficial in cases of diabetes.

THE RELIEF OF TOOTHACHE.—The following is a formula recommended by Professor Babaieff to the Caucasian Medical Society, and indorsed by Kenneth W. Milliean, of Kineton, in the *British Medical Journal:* Melt white wax or spermaceti, 2 parts, and when melted, add carbolic acid crystals, 1 part, and chloral hydrate crystals, 2 parts; stir well till dissolved. While still liquid, immerse thin layers of carbolized absorbent cotton wool, and allow them to dry. When required for use, a small piece may be snipped off, and slightly warmed, when it can be inserted into the hollow tooth, where it will solidify. The ease produced by this simple method is really very great.

BISULPHIDE OF CARBON A CAUSE OF INSANITY. California physicians who have attended various cases of trouble arising from the poisonous properties of bisulphide of carbon, have become satisfied that the inhalation of the vapor of this substance will produce insanity. The bisulphide is used in Los Angeles County to prevent the spread of the grape disease, phylloxera. Several strong and healthy men who have been exposed to the fumes of the vile stuff have become insane. It may be a subject worthy of investigation whether other deleterious gases may not in like manner affect the human brain.

EFFECT OF PECULIAR PERSPIRATION.—An exchange mentions as a curious instance of the slight causes which promote oxidation, the experience of a manufacturer of fine cutlery, who found at one time a large portion of his goods being returned to him as in damaged condition. Instead of bright, clean surfaces, he found rusty, deeply oxidized blades. After much watching to determine the cause, it was located upon the man who sorted and wrapped the knives in packages. Every thing be touched was found to rust from the peculiar acid character of his skin exhalations.

APPLES AS FOOD.—In a bushel of ripe Hubbardston Nonsuch there is about six pounds of soluble nutritive material, in Tolman's Sweet about seven pounds, and in Baldwin about five pounds, and this material will vary to a considerable extent in value. These results agree with practical experience in feeding apples to animals. When eaten in connection with farinaceous food they serve to maintain health and improve the appetite,

MINING AND SCIENTIFIC PRESS.

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SAN FRANCISCO:

Saturday Morning, Nov. 24, 1883.

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Drawings Copied—W. H. Smyth, S. F.

Assessment Notice—Gould & Curry M. Co., S. F.

☞ *See Advertising Columns.*

Passing Events.

Next week our annual Thanksgiving occurs, and the proclamation having been issued the good housewives are even now preparing for the usual extra dinner. The fare in the miners' cabin will change, too, from the regular pork and beans to something better, it is to be hoped, for indulgence in the good things of life makes a beneficial change for all of us.

Though we read of snow and ice in the mountainous region, the weather in these latitudes is sunny and pleasant, the fogs of last week having been dissipated.

Aside from what our summary notes there is little new in mining affairs. Utah seems to be prospering rather more than her neighbors, and is attracting more than the usual share of attention. This is due to her bullion shipments, no doubt. The bullion shipments, regularly made, speak louder than any thing else in favor of her mines.

We devote more space this week to our mining summary than usual, and change some of the tables to other pages, an improvement our readers will no doubt all notice.

THE Cœur d'Alene placers are about far enough away and sufficiently difficult of access to cause a big stampede next spring among miners who think there's millions in it. The ground will be covered with snow from now till June, but this will not dampen the ardor of the stampeders in the least.

Troubles of an Inventor.

When a man makes an invention, naturally the first thing that occurs to him is that he must make something out of it; but before he can do this, it becomes necessary for him to properly secure his rights to himself and patent his idea. The question then is how to go about this. He knows that the government will allow him a patent if he applies for it, but he does not know how to do this. He scarcely knows in whom to confide, even, in asking for advice on the subject. He finds that the mere inventing is not all there is, but that apparent troubles begin to beset him as soon as he has invented.

It is then found necessary to secure the services of a patent agent who is familiar with the forms and requirements of the Patent Office, and who is capable of writing a clear and comprehensive description of the invention, in order that the authorities at Washington may understand it.

But our inventor is again in trouble. He does not know which one of the numerous agencies he sees advertised is the best for him to choose. He finds that some seem willing to do his business for the fun of doing it, apparently, or for the good of human nature, judging by the inducements they hold out; but when he comes to consider a moment, he remembers that honest people can hardly afford to carry on business for others without some compensation. So that class of agents he hardly cares to trust. Then another advertisement shows him that there are certain men who will do all the work of preparing his papers and drawings, and attending to the case for him, and not ask for any pay unless they get the patent. This seems somewhat strange to him, as he knows that few men care to take the risk of other peoples' ventures on their shoulders without compensation, and he knows that people who take large risks expect large profits; therefore he is somewhat shy of this class of agents, albeit their offer seems very reasonable on the surface. Next, his attention is attracted by the alluring advertisement of a bureau or something of that kind, the object of which is apparently to do all manner of good to inventors because they are inventors, and which will not only obtain his patent for him but sell it after it is obtained. This strikes him at first as a very good scheme, and he makes up his mind to try this kind of a concern, but a friend with experience suggests a few queries in connection with the subject.

In the first place he calls attention to the fact that the old-established and responsible patent agencies, which have been attending to the interests of inventors for years, do not consider it proper to carry on the business of selling patent rights in connection with the other business. It is only ephemeral or catch penny establishments which branch out in this manner. There is no record of a long established agency of the kind. The two branches are perfectly separate classes of the business. The talent required to procure patents is of an entirely different kind from that necessary to sell them. Moreover, the two branches conflict. If an institution has two or three amalgamators or incubators for sale, it is not exactly the place an inventor of an amalgamator or incubator would choose with which to intrust his patent application. These and other reasons have weight with a careful man seeking the best person to attend to his business. He finds on inquiry that this class of people invariably want some kind of fee for exhibition of model, or as guarantee, or something of the kind, and that the pretended philanthropy for inventors is expected to bear some fruit, and that immediately.

Our inventor comes to the conclusion, after all, that to have his business properly attended to, with intelligence, experience and honesty, he must employ some agency long enough in the business to have established for itself a reputation for reliability. He expects to pay for their services, and finds, when he inquires, that their uniform charges amount to even less than those imposed, on one pretense or another, by inferior concerns. He finds, too, that there are no extra charges for things supposed to have been paid for in the regular fee, and that having once taken hold of the case, the reliable agency intends putting it through as originally promised, even if the case has to be amended to suit the wishes of the class-examiner several times. And if he continues and obtains his patent, it will be found that the document is worth something more than the mere paper it is written on, and has been so drawn as to stand the tests of the courts in case of necessity. It pays to do business in the proper way and with good firms, in all our transactions, but in none more so than in patents.

Oakland's Telescopes.

Within the past month no less than three large telescopes have been received in Oakland—an 8-inch refractor, by Alvan Clark & Sons, for the Schabor Observatory; and two silvered-glass reflecting telescopes, by John A. Brashear, of Pittsburgh, for private gentlemen—one of 8½ inches clear aperture for D. J. H. Wythe, and one of 10½ inches clear aperture for Mr. Charles Burckhalter. The one owned by Doctor Wythe will be mounted equatorially, and he is now constructing a small observatory to receive it. The larger one is complete and in operation in the neat little observatory of Mr. Burckhalter, at 962 Chester street.

This class of telescopes is comparatively of recent invention. Dr. Henry Draper, at Hastings on the Hudson, about 10 years ago made the first instrument of this description in America. These new reflecting telescopes possess many advantages, among which may be mentioned that they are entirely free from chromatic aberration, they are only half the length of achromatics of the same aperture; their dividing power on close double stars can not be surpassed, as they give smaller star disks than refractors; and for lunar and planetary detail they are very superior. Mounted as Newtonians, every part of the heavens may be observed with ease and comfort.

The power of these instruments as compared with achromatics is given by John Browning, of Loudon, who is a clever optician and the maker of both refractors and reflectors, as one-sixth less in light-grasping powers, while in their dividing power—that is, their power of separating double stars—they are fully equal to the finest achromatics of the same aperture; while the Rev. T. W. Webb, the author of that invaluable little book "Celestial Objects for Common Telescopes," assigns equal light to Newtonian reflectors of 9, 6½ and 4½ inches, and achromatics of 8, 5¾ and 4 inches respectively.

Mr. Burckhalter's instrument is mounted as an equatorial in the Newtonian form, with declination circle reading to one minute of arc, while the time circle reads to four secouds of time. It is provided with a slow motion in declination, and also in right ascension, by which, when the object is brought in the field of view, it may be followed with very little trouble, by means of an endless-screw motion, imparted by a handle brought to a convenient position for the hand of the observer. The eye-pieces range in power from 90 to 648 diameters, which is all a telescope of even larger aperture would bear at the low altitude of Oakland. The mounting is extremely rigid, weighing about 800 pounds, but the telescope moves with the greatest ease.

There has been very little good observing weather since the instrument has been placed in position, but the tests so far given show it to be a very superior telescope, and its performance has greatly exceeded the owner's expectations. During a few hours when the atmospheric conditions were favorable the planet Saturn was observed, the numerous belts on the globe, the dusky or crape ring, and the division between the rings, were easily seen, while six satellites and the division in the outer ring were plainly visible. The snow-caps of Mars were remarkably plain, and the markings of the seas and continents which intersect his ruddy globe were distinctly made out. The planet Jupiter, with his varied colored belts, was a splendid object; but the Great Nebula in Orion—that wondrous cloud of light, and one of the most remarkable objects in the heavens—was by far the grandest sight of all. Studded with stars, the dark rifts, and clouds, and sprays of fiery mists, the chaotic material of future suns, as seen with so large a telescope, form a grand and imposing picture. Mr. Brashear's specula have already gained an enviable reputation, and these are but the pioneers on this Coast of many silvered-glass reflecting telescopes.

THE output of bullion in Utah this year will be about $1,000,000 more than for 1882. A large number of mines have been working, and the outlook for the coming year is more encouraging than ever before.

The Salt Lake Mining Institute.

Some time since we made mention of the proposed organization of a Mining Institute at Salt Lake City, Utah. The object is to maintain a museum of the ores and minerals, and to collect, classify and preserve all information obtainable respecting the mines and mineral resources of Utah, primarily, and secondarily of adjoining states and territories; to procure and keep on hand or on file geological and mineralogical books, reports, maps, papers, maps of mining districts, and of the underground working of mines; plans, specifications and process of different smelters, mills, pumps, roasters, hoisting and other machinery employed in mining, and the reduction of ores; to publish and distribute annual or monthly reports on the condition and output, growth, development and prospects of the mining industry, and of business connected therewith; and to do all such things as are necessary to the well-being and prosperity of the mining industry of Utah and adjacent regions.

This looks like rather an extended programme, but only partly carried out; a very good institution ought to be evolved from it. It is evident that something similar to the California State Mining Bureau is contemplated, with this difference, however: The Utah Institute is supported by private subscription, while our Bureau is maintained by the direct tax and state aid.

Subscribers to the support of the Institute, at the rate of $12 per year, payable yearly, semi-yearly or quarterly, are entitled to all the privileges of the Institute, to the right to introduce visitors, and to place on exhibition in the rooms samples of the products of their mines, with plans, maps, and written or printed descriptions of their mining property, under the regulations of the executive committee. The payment of $100, or of the yearly subscription for ten years, entitles one to a life membership.

The advantages to miners of founding and maintaining an institution of this kind are many. It is only to be regretted that similar ones had not been established in many other localities years ago. There would now be collected a mass of information of great value to the whole community. In the California State Mining Bureau, which has been in operation only some four years, a great deal of good has been done; a large number of specimens of various kinds have been collected, and more or less information has been compiled and published. Organizations like the Bureau or Institute would do a great deal of good at other mining centers.

The Manufacturers' Association.

A permanent organization of the Manufacturers' Association has been perfected, an election of officers having been held with the following result: President, A. S. Hallidie; Vice-President, Irving M. Scott; and Treasurer, N. W. Spaulding. The Chair then appointed J. H. Gilmore Secretary. Colonel Harney then offered the following:

Resolved, That an Executive Committee of three, to which the President shall be added, shall be appointed, whose duties shall be to examine into the affairs of the Association, to prepare a circular which will embody the principles of this Association, and send same to all manufacturers in this state, and invite membership therein, and also to report to the Board any and all matters that may be necessary for the welfare of the Association, from time to time.

Colonel Harney then addressed a request to the Chair that he might be excused from serving on the committee. The Chair granted the request and appointed Messrs. Garratt, Phelps and Haraszthy. A Finance Committee, consisting of Messrs. Hecht, Harney and Kerr, was also appointed. The Secretary was authorized to solicit subscriptions, and it was decided that the Board should meet on the first Monday of each month, at 3:30 P. M. The place of meeting was referred to the Executive Committee, with instructions to notify the Secretary of its location, and the meeting then adjourned.

A SPECIAL from Milwaukee says: The striking miners at Iron Mountain, Michigan, although confronted by eighty special deputies from Chicago and Milwaukee, induced the engineers and pump miners to leave their mines, and within one day the mines will be completely flooded. The strikers have been informed that they will be paid to date and discharged for the winter.

Collecting Flue Dust.

The importance of condensing the gases which escape from furnaces so as to save the fine particles of ore carried off mechanically and those that are volatilized, has for a long time occupied the attention of metallurgists everywhere. Dr. T. Egleston, of New York, recently visited the lead and silver works at Ems, near Coblentz, on the Rhine, and through the politeness of Mr. Frendenberg, General Director of the works, was enabled to study in detail the methods of condensation and receive from him the important results which have been obtained through a series of experiments lasting over a number of years. The results of these observations Dr. Egleston has embodied in a paper which he read before the American Institute of Mining Engineers, from which we condense the facts presented in this and the following numbers of the PRESS.

All the experiments that have been made in the direction of saving the materials carried off by the gas may be comprised in two categories, —those in which attempts have been made to collect the dust by means of water, and those in which water has not been used. The condensation of gases by means of water is at best a very rude method. Experience has shown that both solid and gaseous products, even when not under the influence of pressure or of high velocities, may traverse considerable depths of water without change and with almost no condensation. Water condensation has been used in this country to some extent, but its results have always been unsatisfactory, both because the material which is so condensed is very difficult to treat, being collected as a liquid mud, which when dry is in the form of an impalpable powder, and because the water supply in most of the places where the works are situated is very limited; so that at the present time most of the serious experiments that are being made are conducted altogether without water. It becomes at once a matter of the first importance in these experiments to know whether great length or great volume of flue within a given extent, or great surface in a limited volume, is better for this purpose of condensing the gases. The experiments made at Ems are quite conclusive in regard to this question, and show that great surface is the most indispensable requisite.

The question of choice between very long flues and very wide chambers seems to be settled definitely, as we shall see by the experiments made in the works at Ems, the conclusion being general that a maximum of surface, without special reference to volume or length, is what is required, and this maximum of surface can be better gained, so far as the condensation is concerned, and also more economically arrived at as to cost, by the arrangement which is there used.

The experiments made for condensing the materials contained in the gases were commenced in a systematic way in the year 1874, when, with the object of obtaining volume, both systems, that of short, wide chambers, and that of long, narrow flues, were constructed, in order to ascertain what should be the principle adopted in the future construction of the works. In order to understand the experiments thoroughly, a ground plan of the smelting works, and of the flues, and a profile of the flue from its point of starting in the works to where it finally terminates in the chimney which discharges the gases into the air, are given herewith.

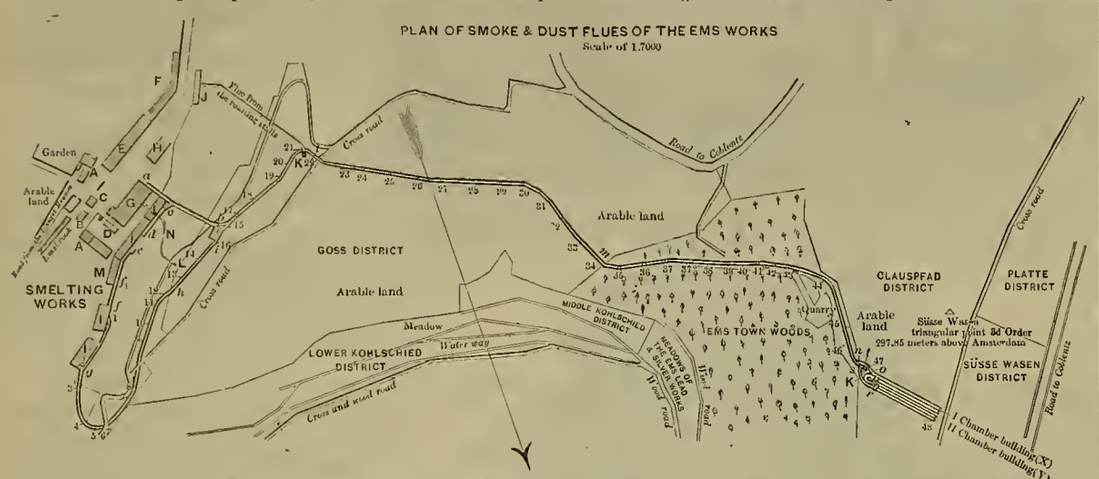
The Ems Lead and Silver Works are composed of two separate establishments. The one which is nearest to the famous watering-place is the mechanical preparation or ore-dressing works, which is one of the largest, the most complete, and also one of the best known in Europe, but with which we have nothing to do in this article. The mines, the smelting works, and a small part of the mechanical preparation works are situated about four miles distant, in a valley running at right angles to the valley of the Lahn, through which a small stream runs. The mine and part of the crushing and selecting works are situated on the eastern side of this stream; the smelting works are situated on the west bank of the same stream. These latter consist of a series of buildings containing the furnaces and storehouses, built upon a plateau several meters above the stream, at the foot of a high hill which, next the works, is very steep, but which, after passing Station 22 (see engraving), rises more gently. Leading away from the works up the hill are a series of flues of various sizes, the first part of which runs along an old road up to the first chimney at Station 22, and from there goes directly over the hill to the highest chimney at Station 47. The U-shaped part of the flue, *c*, *d*, *e*, *f*, *g*, *h*, on which the shaft and roasting furnaces are situated, is joined to the furnaces by means of short flues. The plan shows the position and arrangement of all these buildings and flues. The construction details of the flues at different points will be given later.

The main flue is 1,700 meters in length; counting all its branches, its total length is 2,271.48 meters. The greatest section of the flue is 4.512 square meters. Its total wall surface is 18.060 square meters. Its highest point at Station 47 is 178 meters above the floor of the furnaces. At this highest point it enters a chimney whose section at the bottom is 2.47 meters and at the top 1.80 meters, and whose height is 45 meters, its top being 223 meters above the furnaces. The ventilating flue N, and its chimney L, which were formerly used for ventilating the shaft and cupel furnace house G, and the flue from the roasting stalls, which ends in the chimney at Station 22, have no connection with the main flue. The short and steep flue *a b*, with its arm *c d*, connects the shaft and cupel furnace house, and also some of the roasting furnaces, with the condensing chamber at Station 16. The gases enter on the southerly side, in the compartment .. These gases move towards the northerly side; those in compartment II towards the southerly side. The flue *e f*, *f g*, *h i*, *K*, connects the other roasting furnaces with the main flue also at Station 16, but follows around an old road going gradually and with an irregular curve up the hill, and empties its gases into the compartment III of the condensing chamber at *i*, Station 16. The gases enter on the northerly side in the compartment III, join those in compartment II, and enter the main flue at Station 15.

Electro-Magnetic Ore Separator.

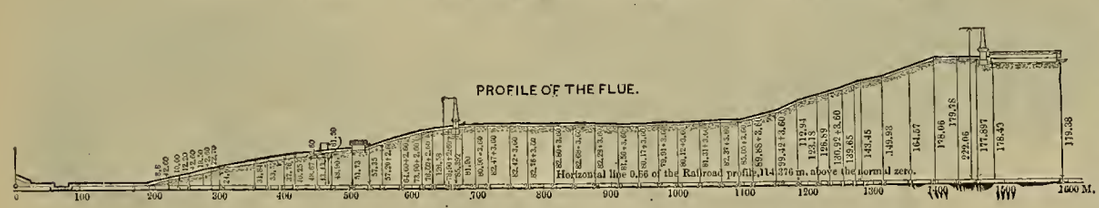
A man named C. G. Buchanan, of Brooklyn, New York, has recently devised a new form of machine to separate the iron in ores or magnetic sands from the gangue or other non-magnetic substances. The machine consists essentially of two revolving rolls, fixed parallel with and a short distance apart from each other, and charged or magnetized by permanent or electro-magnets, in such a manner that a strong magnetic field is formed between them, their outer faces becoming, at the same time, less magnetic, so that as the ore or sand is fed into the magnetic field of the separator the magnetic particles of ore or sand are attracted to the rolls, and carried by the revolutions of the latter around to opposite points where the rolls lose their magnetic force, at which points the magnetic portions of the ore fall by their own gravity from the rolls, while the gangue or non-magnetic portion of the ore falls directly through the magnetic field between the rolls, by which the separation of the iron from the gangue is effected. The rolls are so constructed that, when charged, the magnetic field formed between them is of equal strength throughout their length.

There are several methods within the scope of the invention by which the rolls may be magnetized or charged with magnetism. It is not absolutely necessary that the rolls should be charged from both poles of a battery or dynamo machine, though by that method a better effect can be produced. A number of separators may be charged from one dynamo machine or battery by connecting with only one wire thereof, the effect of north and south polarity being produced by changing the direction of the wrapping of the wires from left to right or right to left, as the case may be, and connecting the other wire with a ground connection, or some suitable conductor, to complete the circuit.



A A Dwelling houses. B Boiler house. C Engine house. D Bakery. E Zinc desilverization. F Slag heap. G Shaft and cupel furnace house.
H Coke shed. I I Roasting furnaces. J Roasting stalls. K K Chimneys. L Ventilating chimney. M Dressed ore house. N Ventilating Flue.

GROUND PLAN SHOWING ARRANGEMENT OF SMELTING WORKS AND FLUES.



PROFILE OF FLUE FROM STARTING POINT OF CHIMNEY.

Academy of Sciences.

Professor Davidson presided at the regular meeting of the Academy on Monday evening last. W. F. Goad was elected a resident member. Mr. Harford presented a specimen of the rare kingfish, from Monterey Bay. Mr. Caselli presented coal from Monterey; Mr. Gilbert, of United States Coast Survey, twelve specimens of fungi collections in Washington Territory, which were identified by Dr. Harkness; Mr. J. G. Lemmon, a new species of fish from a creek tributary to the Santa Cruz River, Arizona; Mrs. Mary K. Curran, three volumes of "Genera Plantarum," by C. Bentham and J. D. Hooker.

Mrs. J. G. Lemmon read some field notes on Arizona plants, describing more particularly the Larrea Mexicana, a plant from which exudes a gum similar to the gum lac of commerce.

Signor Eusebio Molera read a very instructive paper on the Aztec calendar or Mexican Calendar stone, from which an insight has been obtained to the extent of the astronomical knowledge of the Aztecs. The stone was unearthed in the City of Mexico on the 17th of of September, 1790, and was placed in the base of one of the towers of the cathedral, where it remains to this day. The stone is eleven feet nine inches in diameter, and originally weighed twenty-four tons. The conjecture of a number of antiquarians in relation to this object were reviewed by Molera, who described its prominent characteristics by means of a painting of the same size as the original, which was prepared by himself. The central figure was a picture of the sun's face, a distorted human countenance, and about it were geometrical signs and figures of animals, reptiles, birds and specimens of vegetation. There were characters the interpretation of which presented a history of the creation of the earth. Around and about these central figures were cycles containing representations of the days of the month, the days of the year, and other peculiarities. Some antiquarians thought that it was a calendar stone, but Mr. Molera had an idea that it was designed for one of the sacrificial stones, on which captives were formerly slain, their hearts being offered to the sun. He believed it was constructed under the second Montezuma, who, having done nothing to perpetuate his name, determined to construct a sacrificial stone, the same as his predecessors had done. He wanted to made it larger than any of the others, and gave orders that it be two elbows larger than they were. The Indians began hauling the stone, which finally said it would not go any further. There were 10,000 Indians pulling the stone, and the ropes broke and the stone would not move. This the historians cited to show that supernatural phenomena was connected with the event. However, it appears that the stone was really brought to town, and it was so heavy that it broke the canal and fell down. A very finely made drawing, the full size of the stone, was exhibited, as well as photographs.

A GRAND testimonial concert will be tendered to Mr. Hugo Mansfeldt, at the Metropolitan Temple, on Tuesday, November 27th. The Harmonic Society of Oakland, with sixty members, under the direction of Mr. D. P. Hughes, an orchestra of fifteen musicians, the Hughes Glee Club (double quartet of male voices); twelve solo vocalists, and a violin quartet of young ladies of Oakland are among the participants. The programme includes eighteen numbers carefully selected. An enjoyable evening is anticipated. Mr. Mansfeldt is threatened with blindness, and he has been compelled to resign his position as organist and resign all his pupils, consequently his income is gone. In this strait his friends make an appeal on his behalf to the generosity of the public. One concert has been given—in Oakland—and this is the second.

THE Old Telegraph mine, Bingham, is shipping about thirty tons per day from the recent big strike. The ore body is said to be from twelve to fifteen feet wide across the face, and it has been explored sufficiently to demonstrate that it is one of the biggest strikes made in many a day in that great mine.

THERE will very probably be a dispute between Shoshone and Kootenai counties, I. T., as to which county the new mines are located in. It seems that the mines are on the summit of the Cœur d'Alene range of mountains, and that forms the boundary between the two counties.

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Ingersoll, D2 3", beat National 3½"	.505 " "
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National beat Rand	.139 " "

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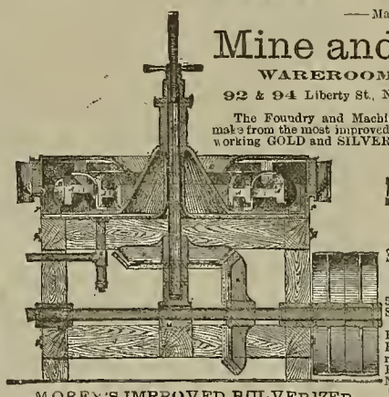
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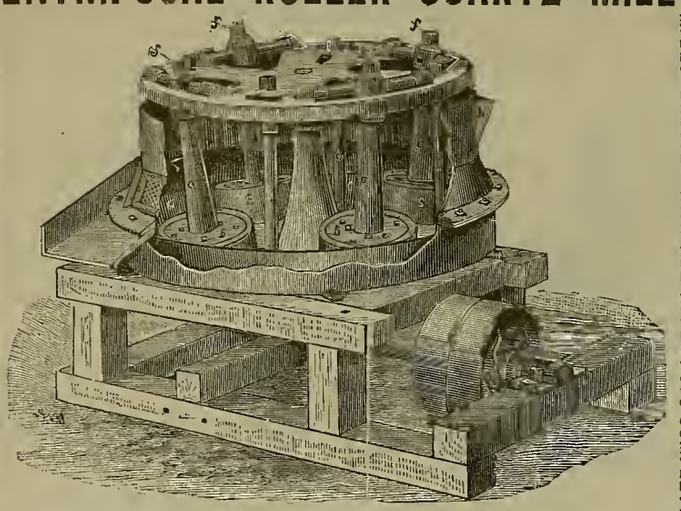
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5. The wear is less than that of stamps.
6. The wearing parts are easily duplicated.
7. It has a much better discharge, and leaves the pulp in better condition for concentrating.
8. It is a better Amalgamator, saving fully nine-tenths of the gold in the mill; the balance can be saved on plates in the usual manner.
9. It is continually crushing; not like the stamp, using power to suspend it in air ninety-nine one-hundredths of the time and the balance making a thundering noise, and accomplishing *comparatively* small results. It is as far in advance of the stamp mill as the present method of making flour with improved rolls is over the Indian's mode of crushing corn in a stone mortar.

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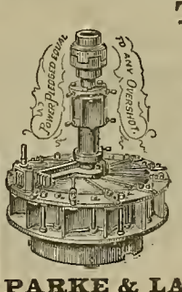
The wear and tear is nominal, and the construction so simple that any miner can put it up and run it, and the low price brings it within the reach of all mill men, as it will save enough to pay for itself in any mill in a very short time. One machine will concentrate the tailings from a five-stamp battery.

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Invaluable to those engaged in dry crushing quartz mills, quicksilver mines, white lead corroding, refining, threshing machines and all occupations where the surrounding atmosphere is filled with dust, obnoxious smells or poisonous vapors. The Respirators are sold subject to approval after trial, and, if not satisfactory, the price will be refunded. Price, $3 each, or $30 per dozen. Address all communications and orders to

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F

FOR WEEK ENDING NOVEMBER 13, 1883.

288,204.—PAPER BAG AND TWINE HOLDER COMBINED—Albert Brown, Mendocino, Cal.

288,304.—FIRE ESCAPE—J. H. Burks, Los Angeles, Cal.

288,409.—CENTRIFUGAL PUMP—C. A. Christensen, Willamina, Or.

288,321.—SURVEYING INSTRUMENTS—M. Farley, Portland, Or.

288,246.—HARNESS LINE-HOLDER—A. J. Larson, Newhall, Cal.

288,532.—FOLLOWER FOR RAM ELEVATORS—Wm. R. Low, S. F., Cal.

288,356.—MAGNETIZING LOCOMOTIVE WHEEL TIRES—E. J. Molera, S. F.

288,256.—TWO-WHEELED VEHICLE—A. P. Nelson, Portland, Or.

288,362.—GANG PLOW—H. S. Palmer, Santa Ana, Cal.

288,493.—FEED FOR LATH-SAWING MACHINES—Jas. A. Robb, San Jose, Cal.

288,367.—LIFTING JACK—Ira Rose, Salinas, Cal.

288,372.—TELLURIAN—A. C. Shaw, S. F.

288,511.—SPOKE EXTRACTOR—D. S. Tallman, Reno, Nev.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise), at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through DEWEY & Co.'s SCIENTIFIC PRESS American and Foreign Patent Ageney, the following are worthy of special mention:

DEVICE FOR CONVERTINO MOTION.—Ransom G. Moody, San Jose. No. 287,307. Dated Oct. 23, 1883. The object of this mechanical movement is to convert a reciprocating rectilinear motion into a rotary motion. It consists in a shaft having a pinion, an oval or elliptical internally-geared rack meshing with said pinion, meaus for throwing said rack from one side to the other at the limit of the stroke, and suitable devices to guide its movement. The object is to transmit the motion indicated in the best manner, avoiding the employment of a crank, and enjoying the advantage for the greater part of the time of t e crank's best point.

CAR TRUCK.—Thomas J. Furbee, Bishop Creek, Iyno Co., Cal. No. 287,374. Dated Oct. 23, 1883. The truck is intended to be adjusted to narrow or wide guage tracks; and it consists in a truck, the sides of which are connected by telescoping plates, to which suitable power is applied to force its sides apart or draw them closer together. The wheeled axles are centrally divided, their inner ends being mounted on sliding boxes, which are connected with the sides of the truck, whereby their expansion or contraction effects the wheels similarly to fit them to broad or narrow track.

STATION INDICATOR.—Wm. W. Campbell, S. F. No. 287,094. Dated Oct. 23, 1883. This invention relates to certain improvements in devices by which streets or stations are indicated, when reached, to passengers within rail way cars; and it consists of a band or belt passing around certain supporting rollers, and a mechanism by which they are caused to rotate, said mechanism being connected with a device beneath the car having an arm to enter the grip-slot of a cable tube, and be actuated by means of lugs or projectors fixed at the proper positions within the tubé.

CENTRIFUOAL PUMP.—Nicholas Didiot, Bakersfield, Keru Co. No. 287,508. Dated Oct. 30, 1883. This invention relates to that class of centrifugal pumps in which rapidly rotating arms filled with water discharge a portion of their water and draw up more from the water source with which they are connected. It consists in the continuation, with said arms, of valves adapted to close the ends of oppositely extended spouts connected to said arms and the spouts when they are at rest, in order to confine the water, and to open them when revolved to permit its discharge.

FIFTH WHEEL FOR VEHICLES.—Jno. S. Klapperich, S. F. No. 287,550. Dated Oct. 30. This improvement in running gear consists of a means for connecting the front axle and bolster so that they can be turned about a central point without the use of a kingbolt to extend through and weaken the axle.

BED LOUNGE.—J. Rentschler, S. F. No. 287,165. Dated Oct. 23, 1883. The object of this improvement in bed-lounges is to gain an extention in the length of the bed when the back is let dowu as a bed, and yet not have too high a back as a lounge.

IF YOU want a lubricant that will run any thing cool write CHARLES J. WOODBURY, GENERAL MANAGER LUBRICATING DEPARTMENT CONTINENTAL OIL AND TRANS. CO., for "Eubrico." It is the best compound-grease in the market. Shipped in 5, 10 and 25-pound cans, half barrels and barrels. Warranted to give satisfaction. Observe the numbers: No. 2 is soft for outside work; No 3 is medium soft; No. 4 is medium hard; No. 5 is very hard, where unusual lubrication is demanded. Send for Catalogue of Lubricating Oils.

Foundry Notes.

New Hydraulic Pumping Machinery.

The new hydraulic pumping machinery for the Combination shaft of the Chollar-Norcross-Savage shaft, on the Comstock, has been completed at the Risdon Iron Works, in this city, and is being tested this week before being shipped. The machinery is similar to that now at work at the Combination shaft, and is an extension of the present system. Its capacity is 2,000 gallons 1,030 feet high per minute, this amount being raised at a single lift. The machinery is intended to be operated by water taken from the mains of the Virginia and Gold Hill Water Company, though provision is made for au engine and accumulator in case of decrease of water supply.

The working pressure will be 2,000 pounds per square inch, and each part has been tested to 4,000 pounds. The machinery is to be placed on the 2,630-foot level, 230 feet below the present pump, and will throw either to the Sutro tunnel or the 2,400-foot station. This is the s'cond of these hydraulic pumps on the Comstock, and the plant is the largest of its kind in the world. The third hydraulic rig is at the Eureka Consolidated mine, Eureka. In that case the hydraulic sinking pump is adopted. Since the erection of this sinking pump it has constantly pumped 520 gallons a minute 600 feet at one lift.

The new machinery has several important improvements. The pumps will be controlled by a new valve motion invented by Mr. Joseph Moore, general manager of the Risdon works, and which will obviate all concussion or danger of over-pressure on the pipes. Saturday of this week the pumps are to be operated, and any one desirous of so doing can see them working. In next week's PRESS we shall give a detailed description of this new machinery.

Mining Share Market.

Quietness still reigns in the stock market, little business being done and quotations changing only slightly. Up on the Comstock they are hopefully working away. At the north end the joint Union Consolidated and Sierra Nevada station at the 3,100 level if completed. The south drift will be continued to a connection with the main north drift on the 3,100 level of the Mexican. Meantime its progress south will be along and near the streaks of gold quartz cut in the winze. The north drift into the Sierra Nevada will at once pass into very interesting ground, and its progress will be closely watched by mining men. At the Gould and Curry the joint Best and Belcher winze below the 2,500 level has passed through a peculiar base-metal formation of decomposed material which may be found to overlie something of value. At the Hale and Norcoss they have obtained some good prospects in the several drifts and crosscuts run on the 2,700 level, but at nearly every point they have been stopped by indications of more water than could be conveniently handled at present. This level can not be fully and squarely explored until the new hydraulic pump at the Chollar-Norcross-Savage shaft goes into operation. At Gold Hill the Yellow Jacket folks are extracting about 100 tons of ore per day, and considerable amounts are being extracted by other companies. Most of the mills on the Carson River are now running nearly to their full capacity.

Job Press for Exchange.

We have just received a new improved Rotary Job Printing Press of approved style and make, which we will sell at a bargain or exchange on favorable terms for a Washington hand press. Size of chase inside 7x10 inches.

DEWEY & Co., Publishers.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions The pavilion has new varieties of performances. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time they intend to pay for it*, let them not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, aud, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $4 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turniug a leaf.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Andes S M Co	Nevada	23	25	Nov 10	Dec 20	Jan 9	B Burris	309 Montgomery st
Boston Con M Co	California	5	25	Nov 21	Dec 24	Jan 14	F E Luty	330 Pine st
Bullion M Co	Nevada	28	20	Nov 16	Dec 18	Jan 7	J N Brazell	320 Montgomery st
Bodie Tunnel Co	California	3	15	Nov 1	Dec 7	Dec 27	C C Harvey	309 California st
Benton Con M Co	Nevada	11	10	Nov 1	Dec 6	Dec 24	W H Watson	302 Montgomery st
Bucna Vista Petroleum Co	California	31	25	Oct 30	Dec 5	Dec 27	L Kennann	220 Sansome st
Caledonia M Co	Dakota	14	10	Oct 21	Dec 13	Jan 11	W L Oliver	328 Montgomery st
Columbus Con M Co	Nevada	1	25	Nov 5	Dec 10	Jan 3	J M Buffington	309 California st
California M Co	Nevada	9	20	Oct 1	Nov 7	Dec 5	C F Gordon	309 California st
Champion M Co	California	13	10	Oct 8	Nov 15	Dec 8	Theo Wetzel	522 Montgomery st
Elko Con M Co	Nevada	2	15	Oct 6	Nov 12	Dec 4	F Sperling	309 California st
Eureka Con M Co	Nevada	7	10	Sept 27	Nov 10	Nov 30	A F Main	418 Jackson st
Eureka Tunnel Co	Nevada	2	50	Nov 9	Dec 10	Jan 11	J Pardy	Eureka, Nevada
Gould and Curry S M Co	Nevada	46	50	Nov 7	Dec 12	Jan 3	A K Durbrow	309 Montgomery st
Gold Lead M Co	Nevada	4	5	Nov 9	Dec 17	Jan 8	J Bronzan	328 Montgomery st
Hale & Norcross M Co	Nevada	79	50	Nov 17	Dec 21	Jan 14	J F Lightner	309 Montgomery st
Henrietta Gravel M Co	California	7	02	Oct 23	Nov 23	Dec 14	L Gross	530 Washington st
Martin White M Co	Nevada	16	25	Sept 22	Nov 7	Dec 6	J J Scoville	309 Montgomery st
McElroy Gravel M Co	California	11	25	Oct 25	Nov 30	Dec 26	J T Fogarty	306 Montgomery st
Original Keystone M Co	Nevada	7	30	Nov 21	Dec 22	Jan 10	F E Luty	330 Pine st
Savage M Co	Nevada	27	50	Nov 3	Dec 7	Dec 27	E B Holmes	309 Montgomery st
Union Con M Co	Nevada	24	50	Oct 15	Nov 20	Dec 11	J M Buffington	309 California st
Utah S M Co	Nevada	46	1.00	Oct 11	Nov 16	Dec 3	C C Pratt	309 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Black Range Con M Co	Arizona	C B Holmes	309 Montgomery st	Annual	Dec 4
Bechtel Con M Co	California	W H Lent	309 Montgomery st	Annual	Dec 10
Eintracht Gravel M Co	California	H Kunz	316 Post st	Annual	Dec 4
Head Center & Tranquillity M Co	Arizona	J W Pew	310 Pine st	Annual	Dec 11
Ithaca Con M Co		W Grainger	305 Sansome st	Annual	Nov 27
Kentuck M C	Nevada	J W Pew	310 Pine st	Annual	Nov 28
Mexican M Co	Nevada	C L McCoy	309 Montgomery st	Annual	Dec 4
Peck M Co	Arizona	C T Bridge	224 California st	Annual	Nov 28

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Bulwer Con M Co	California	W Willis	309 Montgomery st	15	July 2
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	Nov 19
Mt Diablo M Co	Nevada	R W Heath	318 Pine st	25	Nov 26
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	Nov 12
Silver King M Co	Arizona	J Nash	315 California st	25	July 12

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Oct. 31.		WEEK ENDING Nov. 7.		WEEK ENDING Nov. 14.		WEEK ENDING Nov. 21.	
Alpha	1.90	2 00	1.75	1.90	1.15	1.60	1.05	1.35
Alta	1.30	1.60	1.30	1.65	1.00	1.45	1.00	1.25
Andes	.65	.70	.65	.70	.35	.65	.35	.40
Albion	....	.40	....	.40	....	.40	....	.40
Argenta	.15	.20	....	....	....	....	....	.10
Atlas	....	....	....	....	....	....	....	....
Belcher	1.00	1.15	....	....	.85	.90	....	....
Belding	....	....	....	....	....	....	....	....
Best & Belcher	3.60	3.90	3.60	3.85	3.00	3.60	3.00	3.35
Bullion	....	.85	.65	.66	.50	.65	.45	.50
Bechtel	....	....	....	....	....	....	....	....
Belle Isle	.40	.45	....	.45	.40	.45	.35	.40
Bodie Con	.25	.40	.30	.40	.25	.35	.35	.50
Benton	.15	.20	....	.15	.10	.15	.05	.10
Bodie Tunnel	....	.10	....	.05	....	....	....	.20
Caledonia	....	.15	....	....	.10	.15	....	.15
California	....	.10	.25	.30	.25	.30	....	.25
Challenge	....	.35	....	....	....	.35	....	.35
Chollar	2.25	2.40	2.05	2.35	1.65	2 15	1.65	2.05
Confidence	....	....	1.50	1.70	1.30	1.50	1.30	1.50
Con. Imperial	....	....	....	.05	....	.05	....	.05
Con. Virginia	.45	.55	.45	.50	.35	.45	....	.45
Crown Point	....	1.20	1.05	1 10	.80	1.05	.85	.95
Day	....	....	....	....	....	.40	....	....
Elko Con	....	....	....	....	.20	.40	....	.20
Eureka Con	4.15	2.25	4.00	5.00	....	3.85	....	3.85
Eureka Tunnel	.05	.10	.05	.10	....	.05	....	....
Exchequer	.40	.50	.40	.45	.35	.45	.35	.40
Grand Prize	.45	.65	.45	.60	.30	.40	.25	.30
Gould & Curry	1.80	2.00	1.70	1.90	1.20	1.65	1.25	1.50
Hale & Norcross	2.00	2.40	1.70	2.25	1.35	1.80	1.35	1.60
Holmes	....	....	....	.20	....	....	....	....
Independence	....	....	.35	....	....	....	....	....
Julia	....	.05	....	.05	....	....	....	....
Justice	.25	.35	.25	.30	.15	.30	....	.25
Jackson	....	....	....	.50	....	....	....	....
Kentuck	....	....	....	2.00	....	2.50	....	....
Martin White	....	.25	....	....	....	.25	....	.25
Mono	....	....	....	....	....	....	....	....
Mexican	3.05	3.35	3.00	3.30	2.25	2.95	2.25	2.70
Mt. Diablo	....	4.00	....	4.00	....	....	3.00	3.25
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	....	....	....	....	....	....	....	....
Northern Belle	....	4.25	4.00	4.25	....	4.00	3.90	5.90
North Noonday	....	....	....	....	....	....	....	....
Navajo	3.35	3.65	3.05	3.95	3.70	3.85	3.70	3.75
North Belle Isle	.55	.60	.50	.55	....	.55	....	.50
Occidental	1.00	1.40	....	1 40	....	1.00	1.00	1.20
Ophir	5.75	5¾	4.80	5¾	3.70	4.05	3.70	3¼
Overman	....	.30	.25	.30	....	.28	.20	.25
Oro	....	....	....	....	....	....	....	....
Potosi	.85	.95	.75	.90	.55	.75	.65	.65
Final Con	....	....	....	....	....	....	....	....
Savage	.85	.95	.60	.90	.50	.80	.50	.60
Seg. Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	3.65	4.00	3.3	4.15	3.20	3 90	3.20	3.65
Silver Hill	....	.05	....	....	....	....	....	....
Silver King	....	8.00	....	....	....	7.75	....	7.75
Scorpion	....	.50	....	.50	.45	.50	....	.50
Tuscarora	....	....	....	....	....	....	....	....
Union Con	3.55	3.70	3.55	3.80	2.60	3.75	2.60	2.70
Utah	1.70	1 80	1.40	1.70	1.30	2.25	2.20	2.30
Ward	....	....	....	....	....	....	....	....
Wales	....	....	....	....	....	....	....	....
Yellow Jacket	3.30	3.50	3.05	3.35	2.50	3.30	2.30	2.90
	....	....	....	....	....	....	....	....

Sales at San Francisco Stock Exchange

THURSDAY A. M., NOV. 22.

120	Alta	1.20	
100	B. & Belchr	3 10	
40	Bodie Con	.36	
300	Chollar	5.05	
250	California	.30	
50	Eureka Con	4	
50	Gould & Curry	1.50	
500	Grand Prize	.35	
120	Hale & Nor	1.45	
100	Mt. Diablo	3.75	
60	Mexican	2.50	
200	N. Belle Is	.55	
20	Navajo	3.85	
200	Ophir	5½	
25	Occidental	1.10	
910	Potosi	.60@65	
30	Savage	.50	
70	Sierra Nevada	3.15@3.20	
100	Scopion	.40	
10	Utah	2.30	
250	Union Con	3.35	
35	Yellow Jacket	2.75	

AFTERNOON SESSION.

200	Alta	1.05
200	Andes	.35@40
100	Bodie	.35
205	Best & B	.3
430	Chollar	1.90@1.95
100	Con. Virginia	.40
150	Crown Point	.90
10	Exchequer	.40
200	Gould & Curry	1.35
240	Hale & Nor	1.30@1.35
100	Justice	.20
130	Mexican	2.30@2.35
50	Navajo	3.85
130	Ophir	5½
100	Potosic	60
210	Savage	.50
165	Sierra Nevada	2.85@2.90
100	Silver King	7.25
150	Union	3.10@3.15
160	Utah	2.20
100	Yellow Jacket	2.70

Bullion Shipments.

Alice, Nov. 13. $11,182; Hanauer, 13, $16,200; Stormont, 13, $2,887; Vienna, 13, $1,588; Ontario, 13, $8,866; Hanauer, 14, $6,315; Crescent, 14. $1,800; Ontario, 14, $4,409; Vienna, 14, $1,649; Horn Silver, 14, $24,000; Germania, 15, $9,272; Yosemite, 15, $4,788; Hanauer, 15. $2,966; Germania, 16, $8,554; Hanauer, 16, $3,200; Ontario, 16, $8,388; Vienna. 16, $1,659; Hanauer, 18, $6,100; Alice, 18, $13,000; Ontario, 18, $4,230; Vienna, 18, $3,005.

MANY who never complain are nevertheless seriously ill. Use Brown's Iron Bitters and there will be no cause of complaint.

Our Agents.

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J. W. A. WRIGHT—Merced and Tulare counties.
JARED C. HOAG—California.
B. W. CROWELL—Colorado, Utah and Montana.
M. H. JOSEPH—Eureka, Nev.
I. M. LEIHY—San Bernardino and San Diego counties.
J. J. BARTELL—Santa Clara county.
C. E. CURTIS—Kern and Inyo counties.
A. S. DENNIS—San Mateo county.
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Cheap Ore Pulverizer.

There is for sale in this city, by I. A. Heald, American Machine and Model Works, 111 and 113 First street, a Rutherford Pulverizer, an improved revolving barrel crusher, which was only used a few times and is as good as new. It will be sold very much below costs, and miners who are in need of such an appliance for a small mine will do well to make inquiries concerning it. It is suitable for a pulverizing mill for powder or other substances. References as to above can be had upon applying to this office.

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ASSESSMENT NOTICE.

Gould and Curry Silver Mining Company.

ASSESSMENT No. 46.

Levied ..... November 7, 1883
Delinquent ..... December 12, 1883
Day of sale ..... January 3, 1884
Amount ..... Fifty cents per share.

ALFRED K. DURBROW, Secretary.

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ADDRESS all correspondence to the name of the paper or firm, as either of the publishers or editors connected with the office are quite likely to be absent at times.

Thanksgiving, 1883.

By the President.

In furtherance of the custom of the people at the closing of each year to engage, upon a day set apart for that purpose, in a special festival of praise to the Giver of All Good, I, Chester A. Arthur, President of the United States, do hereby designate Thursday, the 29th day of November next, as a day of National Thanksgiving. The year which is drawing to an end has been replete with evidences of Divine goodness. The prevalence of health, the fullness of the harvests, the stability of peace and order, the growth of fraternal feeling, the spread of intelligence and learning, the continued enjoyment of civil and religious liberty—all these and countless other blessings are cause for fervent rejoicing. I do, therefore, recommend that on the day above appointed the people rest from their accustomed labors, and, meeting in their several places of worship, express their devout gratitude to God that He hath dealt so bountifully with this Nation, and pray that His grace and favor abide with it forever.

[Signed] CHESTER A. ARTHUR.

By the President:

FREDERICK T. FRELINGHUYSEN,
Secretary of State.

By the Governor.

STATE OF CALIFORNIA, EXECUTIVE DEPT.,
SACRAMENTO, CAL., November 10, 1883.

Grateful to Almighty God for the manifold blessings which we as individuals and as a state have received from His hands, let us, as becomes an enlightened and Christian people, and in such manner as may seem best and most fitting to each, unite in thanksgiving to the Great Giver of all for benefits.

During the past year peace has reigned throughout our borders, plenty has smiled upon us; for all of which and many other blessings we should be truly thankful to a kind Providence. Especially should we be thankful for having escaped the ravages of the yellow scourge by which our neighbors have been so sorely afflicted.

Therefore, in accordance with a time-honored custom, sanctioned by usage, I, George Stoneman, Governor of the State of California, do hereby designate and set apart Thursday, the 29th day of November, 1883, as a day of thanksgiving and praise.

In testimony hereof I have hereunto set my hand and caused the Great Seal of the State to be affixed on this, the 10th day of November, A. D. 1883.

[Seal.] GEORGE STONEMAN,
Governor of the State of California.

Attest: THOMAS L. THOMPSON,
Secretary of State.

THE Salt Lake *Tribune* has received a letter from Emery County, Utah, giving a description of a mining district recently discovered by Wilson and Hutchinson, near Cedar Mountain. The ore is said to be found in the sandstone, similar to that of Silver Reef, but the letter fails to give the value. Ore is said to be abundant, and wood and water plentiful. The country is reported mild and excellent for winter work.

WHEN you don't just know what ails you; when you feel aches and pains all over; when you feel tired and faint, use Brown's Iron Bitters. A wonderful reviver.

SUFFER

no longer from Dyspepsia, Indigestion, want of Appetite, loss of Strength lack of Energy, Malaria, Intermittent Fevers, &c.

BROWN'S IRON BITTERS never fails to cure all these diseases.

Boston, November 26, 1881,
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Gentlemen:—For years I have been a great sufferer from Dyspepsia, and could get no relief (having tried everything which was recommended) until, acting on the advice of a friend, who had been benefited by BROWN'S IRON BITTERS, I tried a bottle, with most surprising results. Previous to taking BROWN'S IRON BITTERS, everything I ate distressed me, and I suffered greatly from a burning sensation in the stomach, which was unbearable. Since taking BROWN'S IRON BITTERS, all my troubles are at an end. Can eat any time without any disagreeable results. I am practically another person. Mrs. W. J. FLYNN,
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Brown Chemical Co.
Baltimore, Md.

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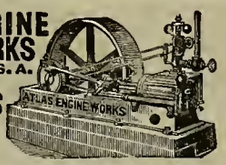
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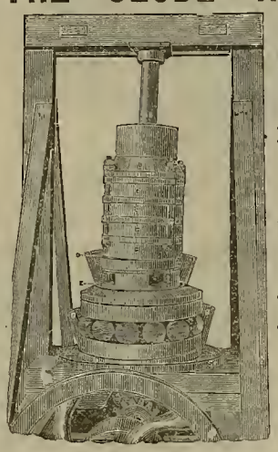
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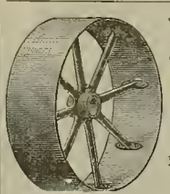
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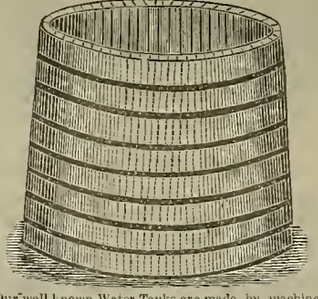
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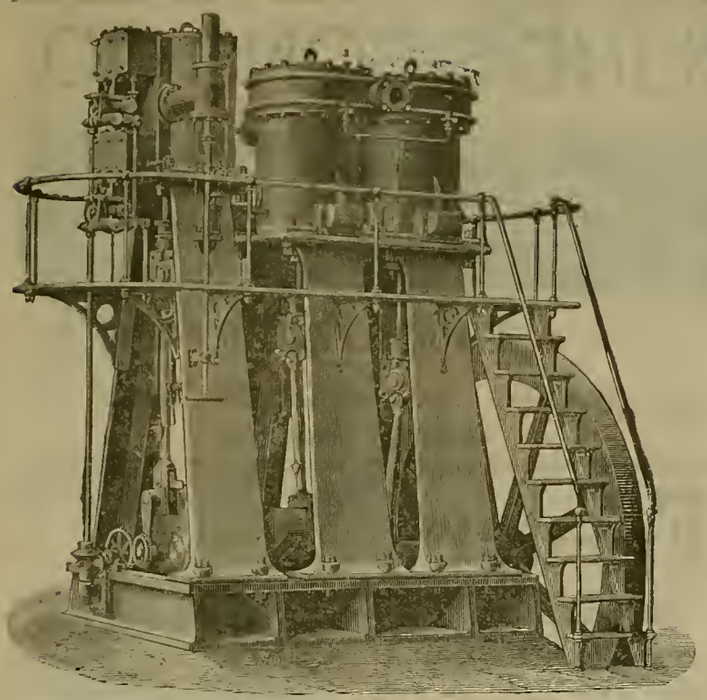

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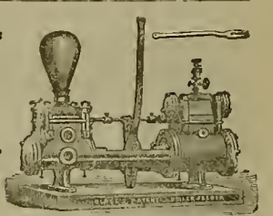


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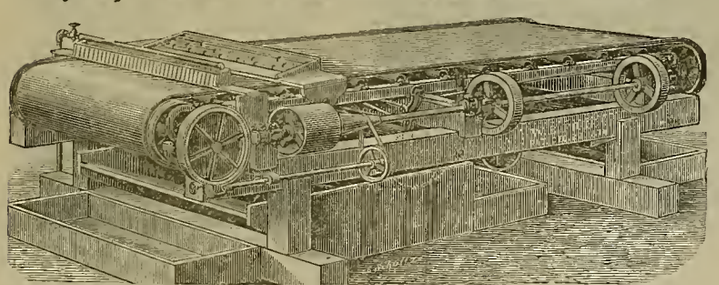
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That legal advice has been given that *all shaking motion* applied to an *endless traveling* belt used for concentration of ores is an infringement on patents held and owned by the Frue Vanning Machine Company

That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.

That the patent laws make *users* of infringements responsible as well as makers, and the public is therefore warned that there is considerable risk in purchasing any end-shake machine until our various patents have been decided.

That if there are those who for any reason prefer an end-shake machine, we can manufacture and sell to such machine of that description, as efficient as the Triumph, and at a lower price, and no liability for infringement will then be incurred by the purchaser.

That we shall protect ourselves against any one making, selling or using any machine infringing any of our patents. Patented July 9, 1867; May 4, 1869; Dec. 22, 1874; Sept. 2, 1879; April 27, 1880. Patents applied for.

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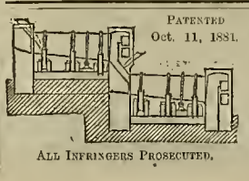
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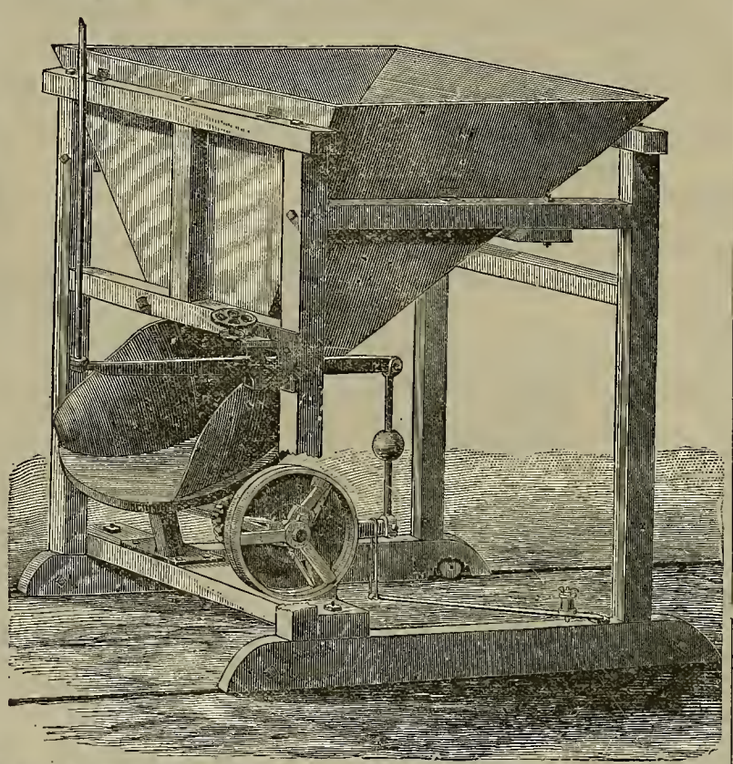
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Standard	20	"	" "	"
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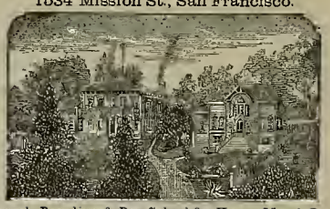
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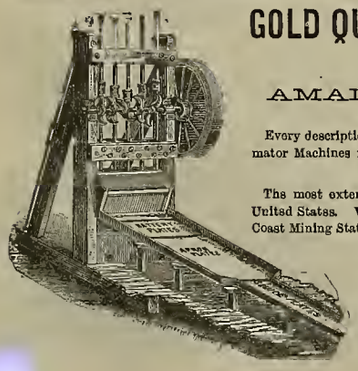
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SAN FRANCISCO, SATURDAY, DECEMBER 1, 1883.

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Triangular and Four-Sided Mining Claims.

The question of parallel end lines of mining claims has frequently been discussed, but miners are not always as careful as they should be with their locations in conforming to the rules with respect to them. In regard to the necessity of parallel end lines, the matter is fully explained in the decision of the Secretary of the Interior in speaking of the claims of certain New Mexico miners, wherein he refers to the decision of the U. S. Supreme Court in the case of the Eureka Consolidated Mining Co. vs. the Richmond Consolidated Mining Co., in which it was held that Section 2320 of the Revised Statutes requiring the end lines of each claim to be parallel with each other is merely directory, and no consequence is attached to a deviation from its direction. (5 Sawyer 131.) But the Hon. Secretary further states that the statutory direction as a rule should be followed, and that he fully approves of the practice of the Land Office requiring surveyers to conform thereto in the respect named.

There is no authority for the location or patenting of lode claims triangular in shape. If the provisions of section 2320 of the Revised Statute in the matter of location are complied with, no good reason can exist why a survey of a mining claim need be triangular in form, though with the proper exclusion made, the *surface ground* claimed by an applicant and embraced in his patent may present on the plat of the survey, the lines of which conform to the law, an irregular form or aspect.

A short time since U. S. Surveyor-General Rollins, of Tucson, Arizona, sent to the Acting Commissioner of the General Land Office a diagram of the Grand Dipper lode, requesting instructions before approval of the survey. The survey of the claim, made by the deputy, cut off a portion of the right end shown to be in conflict with the Emerald lode, the easterly end line of the Emerald claim thus becoming one of the boundary lines of the Grand Dipper, and not parallel to the easterly end line of the Grand Dipper survey.

The Commissioner sent back word that he did not see how the Surveyor-General could approve such a survey. No reason existed why the survey lines should not conform directly to the lines of the location, they being properly run in the first place. The instructions of the Land Office, (Copp's Mineral Lands, 2d Ed., p. 217), are intended to meet just such a contingency, and that conflicts with other claims may be clearly shown and not avoided, the manner is there laid down in which intersection with conflicting claims may be noted, and of the running of courses and distances from such points of intersection to establish corners of such conflicting claims.

PREPARING GLASS FOR CATHEDRAL WINDOWS.—For the preparation of cathedral glass, flashed or wholly colored, blown or cast plates are, under a German patent, coated with a mixture of equal parts of pulverized basalt, potash, saltpeter and calcined borax, made into a paste with water and subjected to a red heat after drying. The temperature must be high enough to fuse the coating and soften the glass simultaneously. The cooling is effected in the usual manner.

THE Kicking Horse Pass, on the Canadian Pacific, has been abandoned.

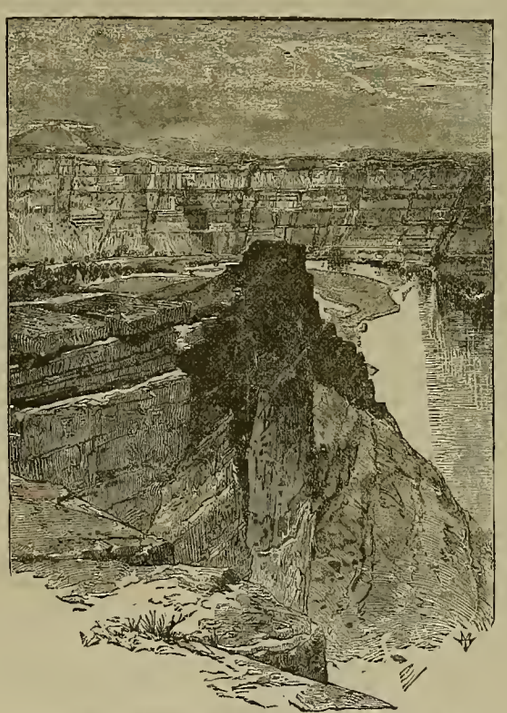
Iron Ore.

There is only one place in California, one place in Oregon, and one in Washington Territory where iron ore is mined. This is rather owing to lack of suitable fuel in proximity to the ore than to lack of ore, as that has been found at a number of places where it is not yet utilized. The only iron mine being worked here in this State is at Hotaling, Placer Co. The mine produced 4,500 tons of first-class iron in 1881. In 1882, 990 tons were made, when a disastrous fire destroyed the works. They were rebuilt, and production is now going on, most of the iron being consumed here. The Puget Sound mine in Washington Territory has one furnace. They employ about 225 men. The Oswego Iron Co. employs about 400 to 500 men. This company is controlled by the Northern Pacific Railroad Co., most of the iron produced being held for the requirements of the road.

Iron is brought to this city from England on returning grain vessels at comparatively low rates of freight, considering the distance; and while the consumption is heavy, the prices paid for the crude metal are by no means exorbitant. Iron ore is now mined in twenty-five States and Territories, as follows: Maine, Vermont, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, Georgia, Alabama, West Virginia, Kentucky, Tennessee, Ohio, Michigan, Wisconsin, Minnesota, Missouri, Texas, Colorado, California, Oregon, Utah and Washington. Very large deposits are found near Lake Superior, in Michigan and Wisconsin; near Lake Champlain, in New York; in Southeastern Missouri; in Northern New Jersey, and at Cornwall, Lebanon County, Pennsylvania. These are the principal sources of iron ore supply in the United States. Smaller deposits are innumerable, and are usually in the hands of individuals, who often lease them to furnace men for a royalty of from twenty-five to fifty cents on every ton of iron mined. The United States produces between 7,000,000 and 8,000,000 tons of iron ore per year.

Colorado River Scenery.

In Powell's "Exploration of the Colorado River of the West" are many graphic descriptions of magnificent scenery, and many engravings representing the salient features of the region. One of these engravings is shown herewith. It is described in the chapter relating the trip from the month of the Uintah River to the junction of the Grand and Green. A long distance below the mouth of the Uintah they enter the mouth of another canyon, almost imperceptibly, as the walls rise very gently. The river sweeps in great and beautiful curves, the canyon walls steadily increasing in altitude. The escarpment formed by the cut edges of the rock are often vertical, sometimes terraced, and in some places the treads of the terraces are sloping. In these quiet curves vast amphitheters are formed, now in vertical rocks, now in steps. The salient point of rock within the curve usually broken down in a steep slope, and the party occasionally stopped to climb up at such a place, where, on looking down, they would see the river sweeping the foot of the opposite cliff, in a great, easy curve, with a perpendicular or terraced wall rising from the water's edge many hundreds of feet. One of these being symmetrical in form, they named "Sumner's Amphitheater," and a view of this we give. The cliffs are rarely broken by the entrance of side canyons, and the boat sweeps round curve after curve with almost continuous walls for several miles.



SUMNER'S AMPHITHEATER, COLORADO RIVER.

The Northern Belle Decision.

The decision in the case of the Holmes Mining Co. vs. the Northern Belle Mining Co., by which the former gets $360,000, is the sensation of the week. The companies operate at Candeleria, Columbus Mining District, Nevada. The Northern Belle is one of the few mines in the United States that have been successfully developed without the aid of an assessment. It has paid 71 dividends, aggregating $2,425,000, and still has ore in sight. The suit of the Holmes, which was for damages on account of alleged trespass, did not attract much attention at first, though very able counsel was employed. The somewhat unexpected decision, however, has attracted universal attention to the matter. The conflicting testimony on the two-ledge theory by the mining experts Raymond and Keyes was somewhat remarkable. The closing scenes of the trial are thus described by the Carson *Appeal* of November 25th: "Yesterday morning Hon. Thomas Wren opened for the defense, and was followed by Colonel Thornton. Judge Boalt closed the case for the plaintiff. During the speeches of the lawyers the court room was packed with attentive listeners, and each man who took the floor held his audience for two hours. At a quarter past four o'clock yesterday afternoon Judge Boalt had finished, and there was a general crowding in the front to listen to Judge Sawyer's charge, but he adjourned the court until six o'clock. At six o'clock Judge Sawyer gave his charge to the jury. He decided that the line separating the Northern Belle from the ground claimed by the Holmes had been fixed by the surveyors and established beyond controversy. The questions involved in the one and two ledge theory he left entirely with the jury, remarking that they had heard the testimony of the experts and must judge for themselves. As to the question of damages, he held that if damages were awarded they must be allowed for the rock as it stood, as the trespass, if any, was intentional, and the defendants should not be allowed any thing for the expense of mining and milling. Both sides conceded that the charge was impartial. The jury then retired."

SOUTHERN MINES.—Mr. E. Chanvin has a mine on White River, twenty-eight miles east of Delano, Kern River, on which the biggest vein is from ten to twenty feet wide a few feet from the top. The lode runs north and south. He also has a mine on Deer Creek, Tulare County, thirty miles from Delano. The lode is from four inches to five feet. It runs a little east of north and south. We have been presented with specimens of ore taken from a depth of ninety feet from the surface of the latter mine which assay from $66 to $100 per ton. The ore is gray and black, and is of fine appearance, containing silver. On the mine of the Delano Gold and Silver Mining Company from the vertical ninety-foot shaft a drift north has been run fifty-five feet and south seventy-five feet. We also have a dark, rich-appearing specimen from this lode also. We expect to hear favorably from future development of these mines.

LUTHER WAGONER, of the firm of Wagoner & Hammond, mining engineers, has returned to this city, having resigned the superintendency of the Minas Nuevas M. Co., Sonora, Mexico. Mr. W. promises us at an early date, a paper on leaching and smelting as carried on at the mines referred to.

CORRESPONDENCE.

Recollections of California Mining Life.*

Men and Events in the Pioneer Days—No.4.

[Prepared for the MINING AND SCIENTIFIC PRESS, by HENRY DEGROOT.]

Their Fortunes and Their Fate.

And where are they, and how have they fared, these pioneers of the pioneers—what is to be said of them, these eye-witnesses of the great gold find—these men who were preseut at this new birth of Califoruia? Rich—millionaires, every one of them, we are ready to exclaim—very sybarites, living in palacial mansions, the recipients of that adulation and homage that large wealth never fails to inspire. In view of the great opportunities enjoyed hy this first crop of the Argonants, it would naturally be supposed that they had amassed riches heyond measnre. But what are the facts? Unfortuuately, quite the reverse of what the majority of mankind would expect, and very unlike what all could wish them to have heen. Not one of these meu who were so permitted to skim the cream from the new El Dorado ever hecame rich; hardly any of them ever acqnired, or at least retained, so much as a competence, while some remain, as others have died, miserably poor! Take for example tbe cases of Snter, Marshall, Wimmer aud Bennett, who figured so conspicuously in connection with the gold discovery: These men, though first on the gronnd, profited little in tbe end by that event—would have been hetter off, indeed, had it never occurred. It proved fatal to all, and especially so to Sutter, who, up till that time, had been successful in all his mnltifarious undertakings—was, in fact, on the road to position and fortune, with the prospect of becoming in a few years the richest, as he was already the most active and enterprising, man in all California.

What Worked the Pioneers' Downfall

Was this very discovery of gold, or rather the large and promiscuons immigration that it led to. That General Sutter was unable to cope with the sharpers brought hither hy the inflowing tide, and who afterwards songht to circumvent him in every possihle manner, or that he failed to protect bis property against the rahble that tried to wrest it from him, proves nothing against his capacity as a financier or his efficiency as a business man. These new comers, with hardly more appreciation of the rights of the early settler than the Bedouins of the desert, squatted on his lands, dispersed his domesticated Indians, stole his cattle, and appropriated without compunction or stint whatever else of a useful kind they could conveniently lay hands upon. To contend with these hordes, armed with rifles and revolvers, and the still more dangerous instrnmeutalities of the law, would he like battling with a pack of ravenous wolves. That the hardy pioneer was dcspoiled of his property and finally vanquished in tbis unequal fight implies neither incompetence nor neglect on his part. Few men would, under the circumstances, have managed their affairs better, or resisted this system of wholesale despoiliation more efficiently than did he.

General Sutter was in many respects a very superior man. His intellectnal endowments were of the highest order. Physically he was equally well favored, being well proportioned and otherwise of great bodily perfection. He was highly educated, first in the schools and afterwards to the profession of arms, the versatility of his talents being manifested by the creditable manner in which he acquitted himself in hoth these callings. His aptitnde for the acquirement of knowledge is evinced by the facility with which he read and spoke four different languages. He natnrally possessed the instincts, and always, even in the midst of his rude surroundings, managed to preserve the manners and bearing of the gentleman, soldier and scholar. And yet, with so much to lift him above the common level, he was utterly without ostentation or vanity. Though learned and well acquainted with hooks, he was thoroughly practical, showing ou all occasions the sagacious, enterprising man of affairs. He was the first to introduce any thing like new ideas and modern improvements into California. Though he did not put up the first flonring or the first saw mill in the country, he was the first to erect establishments of this kind with a view to mannfacturing flour and lumher for the general market. He was also the first to engage in the growiug of wheat and the cultivation of the land on an extended and systematic scale.

The Testimony of General Bidwell.

Gen. John Bidwell, himself one of the earliest, as he is also one of the noblest of the pioneers, bears efficient and kindly testimony to the high qualifications, personal merits and rich deservings of Gen. John A. Sutter. In a letter written not long since to Capt. Wm. F. Swasey, and now in the possession of the Society of Califoruia Pioneers, Gen. Bidwell, among other things, remarks as follows, his statements being here somewhat abbreviated: "General Snter, when I first saw him in 1841, seemed to me the grandest man I had ever met with. Of a fine presence and agreeahle deportment, he spoke German, French, Spanish and English fluently and well. As a conversationalist he excelled, heing at home in the most refined and intelligent company. Yet be was not the least ego-tistical, but listened respectfully to every one, the highand low alike, and hy his courteous manner making all with whom he came in contact his friends. He was a man of the purest honor and the strictest integrity. The California officials had such confidence in all he said or promised that when he sought land for a colony they readily granted all he asked for, and immediately put him in possession of the same. All who knew were ready to trust him, the Russian Fnr Company having sold to him, at the stipnlated price of $100,000, bnt wholly on credit, their entire property at Fort Ross and Bodega. Becoming jealous of his growing power and exasperated at the partiality he manifested towards the American settlers, the Mexican anthorities in California began at last to threaten Gen. Sutter, going so far as to talk of expelling him from the country. When things had reached this pass Sutter advised these intermeddlers that they had better refrain from further threats of this kind, as he was in a position to successfully resist any interference with his rights, and that if these menaces were repeated he might himself be constrained to act on the offensive, his main reliance in case this hecame necessary heing npon the small nnmber of Americans, not over fifty or sixty, then living in the vicinity of the Fort or settled in the Upper Sacramento Valley. This defiant attitude of Sutter towards the departmental anthorities having heen reported at the national capital, Mitcheltorena was dispatched to California with 500 troops, for the purpose of crushing out this growing spirit of insnhordination, and, if need be, driving every American, Sutter included, out of the country. So far from accomplishing snch task, this doighty commander, who was also appointed Governor, found it expedient to make friends with Sutter and his adherents, affairs having ultimately takeu snch turn that he who had come to expel others was himself expelled from California."

Continning, onr worthy informant goes on to remark upon the honndless generosity of General Sutter as manifested towards all who, from sickness, misfortune or other canse, reqnired assistance. No man, rich or poor, whatever his position in life or nationality, ever applied to Sutter for aid in vain. Whoever asked received, nor did he always wait for the snffering and needy to come and make their wants known. When he heard of an incoming immigrant train snowbound in the mountains, or suffering from want of food, he at once sent them provisions on pack animals, in charge of trusty men, these relief parties going sometimes far into and even quite across the Sierra on these errands of mercy. All who arrived at the fort destitute were supplied according to their necessities, and this without any charge heing made or any thing said abont future compensation. There being at that day no hotels or public houses in the country, all who came to Sutter's establishment desiring to stop were there entertained as free gnests, however long they chose to remain. When General Bidwell and his compauions entered the country, Sutter, hearing that there was a party coming in who were in need of provisions, forwarded them supplies while they were yet in the mountaius more than a hundred miles away.

It was by noble and disinterested acts like these, running tbrough a series of years, tbat Geueral Sutter managed to so attach to his cause the entire foreign popnlation, and even many of the native Californians, that when the final outhreak occurred the conquest of the country became an easy matter. That the snhjngation of California did not cost us a long aud bloody struggle is largely due to the course pursued by Sutter and his coadjutors prior to the commencement of active hostilities.

As a partial recognition of ohligations for the service so rendered, the Legislature of this state some years ago voted General Sutter a monthly stipend of $250, limiting the same to a certain nnmber of years. On the expiration of this period this subsidy failed to he renewed, nor have the efforts since made by some to procure a re-enactment of that law ever met with success. As a conseqnence, this fast friend of American institutions and interests in the Far West, this planter of the new civilization on the Pacific Coast, the hardy explorer and typical pioneer, worn ont with toil and weary with waiting, passed into the sere and yellow leaf of life, his last days pinched with want and clouded with sorrow. On the 18th day of June, 1880, the eventful career of the Switzer soldier was brought to a close in the city of Washington, whither he had gone several years before, in the hope of obtaining from Congress some slight compensation for the property of which he had been so nnjustly deprived and the sacrifices he had made in behalf of republican institutions and the American people. Throngh neglect and delay the ingratitute of California was paralleled by the injnstice of Congress, which body, always professing a willingness to do justice to General Sutter, temporized until it was too late. Several members of the House, however, attended his funeral, and there is even a talk of having a stone placed at the head of the old man's grave. It would not indeed he at all strange if, after so starving him to death, California should take measures to erect a grand monument over his remains. This is the way the world often treats its heroes! The body of General Sutter, who was seventy-fivo years old at the time of his death, was taken to the little town of Letitz, in Pennsylvania, where his daughter resides, and there interred in the hnmble graveyard of the place. By his side his aged and estimable wife, since deceased, has also heen huried.

As for Marshall.

Dating from the time of the gold discovery, the story of his life is briefly told. Having during the few months that followed that event collected considerable gold, some of it being a sort of tribnte paid him and Sutter by the Indians, he concluded to leave the diggings, whicb he did. After a short absence he returned and again went to mining, at which he afterwards met with only moderate success. Tiring of this business, he hetook himself to fruit and vine growing, on a patch of land that he had always occupied near the mill, or Coloma, as the town that had here grown np had come to he called. Planting only trees and vines of choice varieties, Marshall had here in the conrse of a few years the best nursery and vineyard in that section of country. Having lived here for some time in a comfortable sort of way he parted with this place, and afterwards does not seem to have had any permanent home or to have remained long in one place. For a time, and up till a year or two ago, he was living in a cabin at Kelsey's Diggings, an ancient mining camp on the opposite side of the river a few miles above Coloma. Latterly he has been sojourning elsewhere in the central mining counties, visiting occasionally San Francisco, Sacramento and other of the larger towns. He is now quite poor, but does not appear to worry over his present condition nor the outlook for the future. By reason of his former history and many good persoual qualities, he is generally well liked, and receives everywhere a cordial welcome. Though an unlettered man, Marshall is intelligent and thonghtful, and, between his reminiscences and a large fund of general information, is capahle of not only entertaining a promiscuous crowd but also of interesting persons of mental culture. He is odd in many of his ways—in some peculiar to the verge of eccentricity—heing little governed hy the opinions of others, and quite indifferent to the etiqnette of conventional life. Taken altogether, he is an agreeahle sort of fellow, and not unsociable, once his confidence is gained—the which is not an easy matter, the scurvy manner in which he fancies he has been treated by the State of California in refusing to properly reward his services, having rendered him somewhat misanthropic and suspicious of strangers. It would really seem as if the state might make some little provision for the old man in his declining years, seeing he is so very needy, and was the actual discoverer of gold, an event generally conceded to have heen a great public blessing. To Hargrave, the discoverer of gold in Australia, there was given a donation of $75,000, and simple justice requires that something shonld be done for Marshall. For a time he did receive from the state of California a subsidy of $100 per month. But the period for which this was to be continued having expired, the Legislature refused to renew it, fearing its further payment would he too great a strain on the financial resources of the state.

* This series of articles will be issued in a new form, with other matter, during January, 1884. Rights reserved.

Harrisburg Mining District.

EDITORS PRESS:—The mines of this district are situated about 329 miles southwest of Salt Lake City, in Washinton County; the east boundary of the district forms part of the west boundary of Kane County.

The geological formation is stratified red and white marl sandstone, at places greatly broken up and eroded. Here and there the said sandstoue alternates with thin seams of clay shale; the cementing material between the sandstone is lime; petrifications of trees, branches, leaves, and ferns, such as are peculiar to the coal formation and identical with the same, are everywhere in great abundance. I have not the slightest doubt but coal will be fouud in the vicinity.

If we observe and examine the large extinct volcauoes which occupy the center and southern part of Utah, together with the volcanic rock which appears here everywhere, we can not be surprised at the foldings and contortions of the strata. The great plains bear abundant and conclusive evideuce to the erosion that has taken place here.

The whole basin was certainly at some remote period a great inland sea, part of "Lake Bonneville," the remnants of which we see to-day represented hy the Great Salt Lake and Lake Sevier. The bed of this "Lake Bonneville" was without doubt on a level with the surrounding table mountains, as the shore lines distinctly marked along the base of the great mountain ranges all over Utah verify and demonstrate. Since then the strata have been beut, folded and broken by volcanic action. The upper portions have heen washed away, leaving the reefs as the anticlinal croppings dipping toward each other on opposite sides of the valley. Here and there the formation is covered with volcanic material, forming as it were a cap to the sandstone.

These beds of red and white sandstone, in particular the white sandstone, which is of a finer texture than the red, are impregnated with chloride of silver, carbonate and iron. Some of the latter appears in nodules aud assays very high in silver.

The dissimilarity of the ore in these sandstone layers and beds is so vast that a very careful sampling of all the material is a great and absolute necessity. The assay value varies from $20 to up in the thousands.

There are only two reasons or causes to account for the presence of ore in these sandstone beds. The first is by sublimation, the mineral vapors ascending from below and depositing the ore in the pores of the sandstone, with other words, impregnating the sandstone. The second is a contemporaneous formation of the ore with the beds in which the same appear; in other words, in explanation, the mineral was precipitated at the same time that the beds of sand and clay, which are now marl sandstone and clay shale, were formed.

This mineral must then of course bave been in solution, and mingled with the waters which, as the waves precipitated the mineral among the sand and clay, and at such places where there was the most vegetable mold, carbon and iron in greater quantities. As both sonrces have their pro's and con's I do not find it necessary to argue about these sources or adopt either of them at this time.

The leading mines in Harrisburg mining district are: Bonanza, which has been very extensively opened and developed by numerous shafts, tunnels and drifts. The main shaft cuts the ore deposit at a depth of 45 feet. The Leads Mining Company have opened and extensively developed their mines and ore deposits in many places; a shaft with double compartment is continually advancing downward. Attached to the mine is a ten-stamp mill. Tecumseh and Barbee and Walker are developed very extensively, and have and are producing largely on a dividend-paying basis. Stonewall Jackson, St. Johns, Shepherd and Leman, Silver Flat, Scott, Silver Point, Silver Crowu, Stormy King, Savage, Stormont, Butte, Bennett, Buckeye, Chlorite Chief, California, Duffin, Emily Jane, Great Western, Interval, Kinner, Luna, Leopard, Maggie, McNally, Maud, Pride of the West, Regina, Thompson, Vauderbilt, and several others more or less extensively developed, and all worthy the attention of both miner and capitalist.

Twenty-two miles north of Leeds is Silver Belt mining district, in Iron County; the character of the ore and the formation of which district are similar to those described in Harrisburg.

W. BREDEMEYER, M. E.
U. S. Surveyor.

Neglected Mines.

San Luis Obispo County has been proven hy prospectors and previous productions to be rich in minerals, but of late we hear very little of any mining carried on or the shipment of minerals. Here are great resonrces now lying neglected. Among the minerals produced have been cinnabar, chrome, copper, asphaltum, gold, salt, lime, silica, gypsum, onyx, snlphur aud coal. Others are known to exist. At one time quicksilver mining was carried on extensively, and large quantities of the liquid metal produced. This was done hy incorporated companies in a period of excitement and high prices, with extensive establishments conducted in the most expensive and extravagant manner, and failure was the general result. But the fact that many hundred thousand dollars worth of quicksilver was obtained is proof of its presence in abnndance, and it appears that under a more economic system, conducted hy co-operative miners, a profitable industry could be maintained. Quicksilver mining has been abandoned in this county, hnt the mines are here and the field is an inviting one for working miners to enter and reopen them with a fair promise of reward for their labor. Where great companies could not pay expenses, much less dividends, with plants costing $200,000 and officers' salaries aggregating thousands monthly, miners might make money. Last year there was a good deal of chrome mined and shipped from the various ports of the county, but since the unfortunate death of Mr. Lewin Wethered, by the railroad accident at Tehachipa last January, the industry seems to have died ont. We occasionally see small shipments of chrome, hut nothing in comparison to former times. Wethered was en route to Baltimore and Washington, in the interest of chrome mining in this county, at the time of the accident, and no one has come to take his place in the encouragement of the business. There is no question of the great abnndance of chromium in this county, and its extraction offers a profitable field for labor. Asphaltum is mined to a limited extent, and this constitutes the chief of our mineral shipments at preseut. Sulphur is found in unlimited quantities, and near the shipping points, hut the world is ransacked for iron pyrites and other miucrals bearing sulphur, while the beds of the nearly pure snbstance in this county are neglected. The gold mines of La Panza are occasionally worked, and afford support to a small community. There is a large area of gold-bearing country in the eastern part of the county, which, although not exceedingly rich, will pay better wages than most laborers receive. Large veins of copper and many rich bowlders of the ore are found in the northern coast region, and the mining of these was once carried on with profit. These are indnstries that should be revived, and the mineral resources of the county, which are certainly great, he made to add to the general prosperity.—*San Luis Obispo Tribune.*

MECHANICAL PROGRESS.

Important to Steam Users.

The water-gauge is one of the most important fixtures pertaining to a steam boiler, and upon its indications the safety of the boiler in a great measure depends. Therefore it behooves the engineer and the steam user to look sharply to its condition at all times, and see that it is in proper order, and that its indications show the true level of water in the boiler.

Probably the most reliable of all the different forms of apparatus that have been devised for showing the height of water in steam boilers is the ordinary gauge cock, properly located and kept clean, says the *Locomotive*. The glass gauge is a valuable adjunct in the hands of a careful man, but as ordinarily constructed is very apt to become stopped up, unless the water is more than ordinarily pure, and then, if too much reliance is placed upon it, its indications are not only useless, but absolutely dangerous. Many accidents that have occurred have undoubtedly been due to the passages to the glass having become filled up with sediment, so that the water-level indicated by the glass was not that of the water in the boiler. When a glass water-gauge is used, more especially when it is placed with the gauge cocks on a column, or "combination," as it is usually called, it should be thoroughly blown out at least three times every day. Merely opening the drip-cock at the bottom of the glass connection for a few seconds is not enough. Remember that there are two passages to the glass, both of which must be kept clean to give the glass any value as a water-gauge. When the glass is to be blown out, close the stop-valve at its upper end, and blow out the water passage at the lower end, then close the stop-valve at lower end, and blow out the steam connections. When you have blown out the glass sufficiently, don't forget to open both valves and leave them open.

With a gauge cock it is different. The very act of "trying" them assists in keeping them clean. The best way to connect them to a boiler is to run each one separately into the boiler straight through the front head. No bends in the pipe should be admitted. If the pipes are straight they may be easily cleaned by running a wire through them, even when steam is on the boiler. The connections should be of good size, not less than ¾ inch pipe being used.

When the cocks are placed on a column or combination the pipes connecting this with the boiler should never be less than 1¼ inch in diameter. They are usually made one-half or three-fourths of an inch. Where bends occur in these pipes, tees or crosses should be used instead of elbows. Then by simply removing the plugs from the tees the pipes may be easily cleaned out without disconnecting them from the boiler. A half inch pipe should be run from lower end of water column into the ash-pit. This pipe should be provided with a valve, by opening which the apparatus may be blown out once or twice daily.

When gauge cocks become worn so that they begin to leak, it is very poor policy to continue them in use. They should be at once repaired or new ones substituted. When it becomes impossible for an engineer or fireman to close a cock after "trying" the water, he is very apt to try it only when he is obliged to, and very naturally too. The possible risk thus incurred of letting the water get low in the boiler is one that no steam user can afford to take.—*Miller.*

The Victory of Mechanism.

At the last meeting of the carriage builders at New Haven the question of apprentices and indentures was grasped in a business-like way, and a committee was appointed for the purpose of systematizing the instruction of new hands in the trade. Of late years it has been well-nigh impossible to obtain an intelligent native-born apprentice. Carriage builders, like other manufacturers, have suffered from the strange aversion of the Yankee boy to a trade. The class that have offered themselves are largely the worthless scum that float about the streets of a great city. Even when once indentures have been entered into, it is complained that they are continually broken, and consequently manufacturers have been compelled to place their reliances either upon foreign journeymen or to employ half-trained men from Canada.

Each ensuing day makes more prominent the fact that we have come upon the times when the mechanic is master. We have crowded professions and ill-filled trades. A chance to fill the position of sub-assistant clerk in a wholesale house is eagerly grasped at by a hundred applicants, though the wages received he scarcely more than "a chance to learn the business."

Let a master workman try to obtain an apprentice at three times the salary offered the clerk, and his applicants will be poor alike in quantity and quality. A skilled workman in any trade need never want for hire; he is eagerly sought after by a hundred employers, and his strong Saxon "wages" are twice as robust as the weak Gallic "salary" of the clerk and book keeper of an equal age or experience.

He is independent of the condition of the market; the skill and cunning of his hand and eye are too valuable to lose, and must be paid whether the products are slowly or rapidly consumed. If a reduction in force is necessary some clerk or type-writer takes his departure. If business ceases, the master hand is eagerly seized by some rival house which knows and values the products of his skill.

It is not as if this country were bound by the superstitions of the old world. A bright workman does not here rise to the level of master mechanic and there stop. There are avenues leading higher yet. The manager of the Willimantic Linen Company, who is reported as about to accept a position in the Pullman Car Company, at a salary of $20,000 a year, was but a few years ago a machinist in the Lowell Machine Shop, and this magnificent advance is not due to any sudden rise in a neglected stock, or lucky venture at an enormous risk, or sudden windfall from a distant relative. It is the natural outcome of a vigorous brain joined to a cunning hand. He who should crush down the obstacles to success in our own days must have as well as the wit to see the service the strength to deal the blow. This is an age of the steam engine, and it is the engineer, not the conductor, who is master.

And if after a career of continued success misfortune does come, commercial panic or flood, or fire, there comes from that man never a cry of "What shall I do for my bread?" The brain may have sought to go beyond its power, but the hand can not lose its cunning. The runner may have fallen short in his leap, but he is as tireless a runner as ever.—*Boston Commercial Bulletin.*

The Oil-Stone.

Twenty years ago the oilstone was found only on the joiner's bench and possibly on that of the machinist, and its sole use was the sharpening of the edges of tools. To-day its use has extended beyond this province of edging tools to that of grinding, reducing, finishing; in fact, invading the limits of the grindstone, emery, rottenstone, tripoli, and reaching almost to rouge. This stone, which is a slate known in science as novaculite—from *novacula*, a razor—is cut and dressed in hundreds of different forms for varying purposes. In any hardware or mechanics' furnishing store it may be found in all manner of shapes under the name of "slips," adapted for sharpening tools of all forms. In dentists' supply stores it may be seen in twenty or more cylindrical and circular forms, and so minute as to be used at a rapid rate of revolution even between the teeth of dental-suffering humanity. Some of these cylinders, ovoids, cones, and edge wheels are so minute that a pea looks large by their side; yet they are all veritable grindstones.

In the manufacture and finishing of the metals, the oilstone plays an important part. Our recent exaction as to fits and measures can hardly be filled except by the use of this stone, and it is in demand for truing turned surfaces and planed areas of iron and brass, slowly grinding down the edges left by the finish-file and the corundum wheel. Recently its powder has largely usurped the place in mechanics' valuation of flour of emery or emery of the higher grades. It is found that a finish "for fit" can be readily obtained by its use in much less time than that hy the scraper; and it does not leave imbedded particles of quartz or corundum to keep up a perpetual wear. This material is not strictly an *oil* stone; it can be used with any vehicle, water, benzine or kerosene oil; it is amenable to all of these. Perhaps its best use is with water, especially when the stone is of the harder sorts, as the Ouachita.—*Scientific American.*

SOFT ALLOY FOR SOLDERING.—A soft alloy which attaches itself so firmly to the surface of metals, glass and porcelain that it can be employed to solder articles that will not hear a very high temperature, can he made as follows: Copper dust obtained by precipitation from a solution of the sulphate by means of zinc is put in a cast-iron or porcelain-lined mortar and mixed with strong sulphuric acid, specific gravity 1.85. From 20 to 30 or 36 parts of the copper are taken, according to the hardness desired. To the cake formed of acid and copper there is added, under constant stirring, 70 parts of mercury. When well mixed the amalgam is carefully rinsed with warm water to remove all the acid, and then set aside to cool. In ten or twelve hours it is hard enough to scratch tin. If it is to be used now, it is to he heated so hot that when worked over and brayed in an iron mortar it becomes as soft as wax. In this ductile form it can be spread out on any surface, to which it adheres with great tenacity when it gets cold and hard.

PRESERVING TIMBER.—One of the most encouraging among the various methods which have been brought forward for the preservation of bridge timber and railroad ties would seem to he that which, in the first place, subjects the finished timber to an adequate dry heat, and then immerse it in a hot bath composed of certain proportions of asphalt and carbolic acid. The effect of this treatment is that on cooling the solvent of the asphalt evaporates, leaving a skin or coating of asphalt on the surface of the wood which resists water and keeps the antiseptic material fixed securely within the pores of the wood. The exterior of the wood, on the completion of this process, presents a smooth and dark surface, requiring no paint.

SCIENTIFIC PROGRESS.

Astronomical Observations at High Altitudes.

Astronomical observations taken at high altitudes in Peru and Bolivia during the first half of the present year have yielded some interesting results, which will be read with interest by California readers who are looking forward to still greater results in the long promised Lick telescope. At La Paz (elevation 12,000 feet), Mr. Ralph Copeland, under whose supervision the observations were made, saw stars with the naked eye that are with difficulty seen in Europe with artificial aid, notwithstanding the light of the full moon. At Puno, (12,500 feet), Canopus, Sirius and Jupiter were visible to unaided vision from 1 to 25 minutes before sunset. A number of small planetary nebulæ and stars, with very remarkable spectra, were found in the southen part of the Milky Way, hy searching with a prism attached to a 6-inch telescope on Professor Pickering's plan. The most remarkable stars showed spectra of little more than two bright lines, which Mr. Copeland had observed in the spectra of various nebulæ. Several close double stars were discovered. At Vincocaya (14,360 feet), the solar spectrum was very much increased in brightness at the violet end. At Arequipa (7,500 feet), the relative humidity of the air was as low as 20 per cent., and not much higher at other stations. Mr. Copeland believed that an observatory might he maintained with great facility at a height of hetween 9,000 and 12,000 feet, the night temperature being little below the freezing point at any season. Beyond that height an increased elevation of 150 feet roughly corresponded to a fall of the thermometer of 1 degree F., and a depression of the barometer of .1 inch, so that at 15,000 feet very arduous winter conditions were encountered. Mr. Copeland thought, however, that in the early summer an experimental station might be maintained for a few weeks as high as 18,500 feet. Pieces of apparatus 2 tons in weight could readily be transported to any of the stations up to 14,360 feet. With the possibilities from the larger and more perfect Lick telescope, made probable by the above reports, the people of California and scientists in general are greatly annoyed at the delays in the construction of that instrument. The latest information from Cambridge is that one of the two immense three-foot glasses has been lying in Mr. Clark's shop for over a year, just as it was cast, the Clarks refusing to commence their work upon it until its companion glass is placed hy its side. When that will be ready, if ever, appears to be a problem to he solved only by time. There is no doubt about the ability of the Clarks to grind and polish the objective if the material ever reaches their hands, but the difficulty in obtaining a solid disk for crown-glass 3 feet in diameter, perfect in all respects, can hardly be appreciated. It will thus be seen that however forward the observatory may be a long time may elapse before the great 36-inch Lick telescope will be in position, ioterpreting the mysteries of the heavens throught the exceptionally clear atmosphere of a California sky.

ATMOSPHERIC ELECTRICITY.—Some time since we published a brief account relative to a series of experiments on the above subject made by Dr. L. J. Blake, and in which it was stated that no convection of electricity takes place by the rising vapor from a charged liquid surface. Further particulars which are now at hand show that Dr. Blake gave to the liquid a potential due to from 400 to 500 Daniel's cells. A plate placed in the track of the vapors was, in the different experiments, either colder than the vapor or of the same temperature. By connecting the liquid with the electrometer, he found a small negative charge increasing during the fifteen minutes which each experiment lasted, but not sufficiently to justify the statement that the electricity is generated by evaporation. In all the work the lamp was removed before connecting with the electrometer, and the whole apparatus was within a metallic covering connected with the earth. Distilled water, sea water from the North Sea, alcohol, sulphuric acid, mercury, and solutions of a number of different salts were tried.

BORIDE OF ALUMINUM.—Joly obtained a boride of aluminum, $BoAl$, in hexagonal golden plates, by reducing boracic acid with alumiuum in graphite crucibles. These crystals were studied before by Deville and Wohler, being known as boron diamonds. Hampe has taken up their study again. He also obtained Bo_6Al as large black lamellar crystals; also yellow quadratic crystals with brilliant luster, inclosing carbon and aluminum. Fourthly, he obtained one or more compounds of boron and carbon, which have not yet been investigated.

A NEW MINERAL.—MM. G. Cesaro and G. Despret have given the name "richellite" to a supposed new mineral from Richelle, in the neighborhood of Vise, Belgium. It occurs in compact masses which have a creamy-yellow color, becoming ocher-yellow on alteration. Its luster is greasy or resinous to earthy, and its hardness varies hetween 2 and 3, the specific gravity being 2. An analysis gave the following results: P_2O_5 Fe_2O_3 Al_2O_3 CaO. At 100 degrees the mineral loses 23.33 per cent water, and at a red heat 6.10 water and 0.11 hydrofluoric acid. MM. Cesaro and Despret leave the composition of the mineral in doubt, but regard it as a fluophosphate of iron and calcium, the fluorine being, in their view, in combination with the iron; the microscopic examination which they propose to make will perhaps throw some light upon the subject.

WOODEN TAPS.—All wooden taps used for chemical purposes may be well preserved by plunging them into a bath of pure paraffine heated to 110° or 120° C. This temperature must he kept up as long as we perceive any air bubbles arising from the wood. The bath is then, and then only, allowed to cool gradually, and the taps are taken out just as the paraffine is about to solidify. The excess of paraffine which still adheres to the outside is rapidly wiped off with a cloth, and the tap is finally subjected to an energetic friction with the same cloth. After this treatment an ordinary wooden tap, which, generally speaking, is soon unfit for use, may be preserved for a considerable length of time, and will be found to resist the corrosive action of dilute acids perfectly. Many other objects in daily use in the pharmaceutical laboratory may be advantageously treated in the same manner, and so preserved for a long time from the effects of corrosive liquids, damp or oxidation.

RADIATION OF SILVER AT THE MOMENT OF SOLIDIFYING.—At the International Electrical Congress, in 1881, J. Violle proposed as an absolute photometric standard the radiation of a square centimeter of melted platinum. Dumas approved of the proposal, and at his invitation Violle performed some preliminary experiments with silver. From the moment when solidification begins, in contact with the containing vessel, until the whole becomes solidified, the radiation of the liquid part remains constant. The constant portion of the radiation is so sharply defined that silver may furnish a secondary fixed standard, which will be especially convenient in all the measurements of spectro-photometry.

THE BEAUTIFUL SNOW.—A Swiss scientist, Floegel, is said to have found, in examining the residue from the evaporation of freshly-fallen snow, living infusoria and algæ, bacilli and micrococci, mites, diatoms, spores of fungi, in immense numbers; also, fibers of wood, mouse hairs, pieces of butterfly wings, skin of the larvæ of insects, cotton fibers, pieces of grass, epidermis, pollen grains, rye and potato flour, grains of quartz, minute pieces of roofing tiles, with bits of iron and coal. Still poets continue to use snow as a symhol of absolute purity.

NICKEL CRUCIBLES.—Nickel crucibles, instead of silver ones, are recommended by M. Mermet for use in chemical manipulations. Nickel, indeed, is slightly attacked by melted potash, hut so is silver itself. Nickel crucibles cost at first much less than those made of silver, and, moreover, they have the great advantage of melting at a higher temperature. It often happens that inexperienced chemists melt their silver crucibles in heating them over a gas lamp; but such an accident is not to be feared in working with crucibles made of nickel.

THE CENTRAL PARK OBELISK.—President Barnard, of Columbia College, in a letter recently published, gave the result of careful computations which he had made relative to the disintegration of the Central Park obelisk's surface due to exposure to the weather. His opinion is that it will take 6,000 years of exposure in this climate to reduce the volume of the obelisk to the depth of one cm. on each side. "The waste in a century would he, therefore, scarcely a perceptible amount," he concludes.

THE SOLAR PARALLAX.—The number of photographs taken of the sun at the recent transit of Venus were 1,700, fully 1,380 of which were sufficiently perfect for measurements; while the transit of 1874 yielded only 221. As the calculations to be made must depend upon the careful measurements of all these photographs, it is computed that at least four years may occur before any definite results can be arrived at.

ARTEMISIAS AND PHYLLOXERA.—M. Poirot having observed among the artemisias which cover immense regions of North America neither flies nor worms nor any insects, also no scorpions or tarantulas, has suggested that the plant might prove adverse to the metamorphosis of phylloxera by covering the ground with branches of artemisias.

LIGHTNING AND RAILROADS.—The idea that lightning is not so destructive as it used to be in the United States, because the network of railroads and telegraph wires lessens the number of accidents, is met by the record of the summer. Fatal thunderbolts have never been more common.

THE SUN'S DISTANCE.—The latest observations indicate that we are distant from the sun 92,700,000 miles. These are the figures obtained as near as may be from the observations of the last Venus transits.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

MAMMOTH.—*Ledger*, Nov. 24: The upper tunnel has reached a point a little over 100 ft from being underneath the main shaft. It is being pushed ahead as rapidly as possible. The new ditch to the Mammoth mine is to be completed next week. There are 30 men working on it. When finished the ditch will have a capacity of 400 inches.

PLYMOUTH.—The Plymouth Consolidated mines are employing a large force of men with plenty of ore in sight.

A. White and partner have good prospects of making a big strike in their pocket diggings.

SUTTER CREEK.—Cor. *Ledger*: The mining outlook is improving but little. A determined effort is being made by a few of the creditors to bring the difficulties of the Mahoney to satisfactory adjustment. The Eureka is said to be improving; the rock is reported of better quality; 20 stamps are kept running. D. T. Davies, Supt. of the Eureka or Amador Con. mine, has resigned his position,

AMADOR CITY.—The Bunker Hill will run the mill to its full capacity as soon as the requisite supply of water can be had. The South Spring Hill continues to look well. A large force of men are at work getting the mill in working order, and making a grade from the mine to the mill. The Keystone Company have commenced sinking in the north shaft. The intention is to sink 260 ft, which will give a total depth of 1250 ft.

CON. AMADOR.—*Dispatch*, Nov. 24: We learn that a large body of very rich ore has been struck in the 1200-foot level of the Consolidated Amador mine at Sutter Creek. This will probably have the effect of livening up that town.

A MINE FOR SALE.—The Wetzlar mine, in Murphy's Gulch, near the celebrated Mammoth mine, is advertised for sale on easy terms. We have no doubt that any one who has means will find this a paying investment.

ST. JULIEN.—*Sentinel*, Nov. 21: J. C. McNamara has taken a contract to run a tunnel 70 ft on the St. Julien quartz claim. It is expected to tap the shaft where $20,000 was taken out twenty-five years ago.

Calaveras.

FRENCH CAMP.—*Mountain Echo*, Nov. 21: Messrs. Hix and Owenby, who have been for some weeks past working a quartz claim at French Camp, situated about five miles northeast of this town, came upon a deposit of gold last week, from which they took 15 ounces in two pans. This mine is known as the Gamblin mine, a miner of that name having worked it for a number of years. Mr. Gamblin realized over $20,000 from the mine.

The Oro Plata mill and Chlorine works will be running in full blast this week.

SHEEP RANCH.—*Citizen*, Nov. 24: Cave City promises to become an enterprising section. The recent sale of the Andrews and Harrington claim will undoubtedly be the means of more than one mine in that section to be opened up and thoroughly prospected. Wheelock & Rodgers it is said have excellent mining property near at hand.

El Dorado.

NOTES.—Cor. of Placerville *Republican*, Nov. 22: Whimtown is below par at present, due to several mines closing down for the winter. Graham Bros. are still working their mine with satisfactory results. The Springfield mine is in full blast sinking a new shaft; it is one of the best mines in the county. I met Mr. F. Wentz, one of the foremen of the Pleasant Valley mine, a few days ago, and asked him if the current report about the big strike in the mine was true. He said, while it was not so much as reported it was never in as good a paying condition as at present. I am of the opinion that this county is on the threshold of a great advance.

Inyo.

CHRYSOPOLIS.—*Independent*, Nov. 17: The Maxim Mill and Mining Co. of New York, with Barrie as superintendent, seems to be pushing things with vim on their lately acquired property in the old Chrysopolis district. The grading for the new mill is completed, the frame-work is up, and the rock-breaker in position. The rest of the machinery has been shipped from New York. About 20 tons of ore, running from $40 to $60 per ton in gold, has been extracted from the Arastra and Hope mines, and placed on the mill dump. Some work is being done in the tunnel towards tapping the ledge in the old Chase mine.

RUSS DISTRICT.—Thomas Kehoe is doing assessment work on his mines in Russ district. The ore on the dump is free-milling, and will assay about $40 per ton. The ledge is well defined and shows the entire 1,500 ft. Tom has worked this property for 16 years past, and is entitled to credit for the pluck shown in holding his grip so long.

Mariposa.

DILTZ.—*Gazette*, Nov. 24: Work has recommenced on the south bank of the mine, which has a face of 50 ft perpendicular by 150 ft across, in which is exposed decomposed matter carrying gold in quantities sufficient to justify the outlay of labor and money. The hard quartz is piled for milling purposes; the dirt and decomposed matter is placed at the head of the sluices, into which it will be dumped as soon as the rains come. This embankment has heretofore produced several rich bonanzas, one of which amounted to 36 pounds of pure gold, taken out by Captain Diltz, who was working alone, in about two weeks' time. Captain Diltz is contemplating the erection of a ten-stamp mill at the junction of Sherlock and Whitlock creeks, which is close to his mine, and equally to the Whitlock and Higman mines, under his control. The last rock crushed at the Higman, a number of years ago, yielded $40 a ton, and at the Whitlock from $15 to $30. During the past two years and a half Captain Diltz has been delayed in his work by pending negotiations with Eastern capitalists; but they have failed to meet their engagements, and now the Captain has concluded that he will waste no more time or money in negotiations, but will work his own mine to the best advantage.

BUENA VISTA.—A boiler, engine and stamps passed up to the mine on Wednesday. A ten-stamp steam-power quartz-crushing mill will soon be in place, and a favorable yield of gold from the Buena Vista will be reported semi-monthly and perhaps oftener. The gold-bearing rock is there.

HORNITOS.—Cor. *Herald*, Nov. 23: The famous Duncan mine, from which so many thousands have been taken out in the past, is again being operated. The parties who have leased the mine are all competent miners. They have hoisting works and a steam pump in running order.

The mill at the Number Nine mine is temporarily idle—undergoing repairs. The mines all look well.

Mono.

NOTES.—Homer *Index*, Nov. 24: Work in the May Lundy mine is being prosecuted with vigor, all the stopes are yielding fine ore, immense quantities of which are being accumulated at the mill. The assessment work has been completed on the Rocky Point mine, situated a short distance southwest of the May Lundy, and the 30 ft tunnel shows a 4 ft ledge of fine ore.

A BIG MINING SALE. — The Noonday, North Noonday and Red Cloud Con. mines at Bodie, together with all property affixed, were sold by auction on Monday last by the assignee in insolvency. The whole property was knocked down at $250, subject to liens aggregating $528,000.74, to A. E. Davis, of San Francisco, President of the South Pacific Coast Railroad.

ROCKY POINT AND GOLD BAND.—These 2 prominent locations in Lake Canyon, just south of and above the May Lundy, are making a good showing. They are principally owned by James Monahan and Thomas Brannan, who have had considerable work done on them. Paul Rhoze worked 10 tons of ore from the Gold Band this summer, in his arastra, and pronounced it pretty good rock, even for Mill creek. The immense ore channel is undoubtedly rich from the Gorilla to the Bryant.

Nevada.

MURCHIE.—*Transcript*, Nov. 24: The ten stamp mill at the Murchie is run continuously on rock from the principal ledge, which is being worked as deep as 700 ft. The eight stamp mill is used in crushing rock from other ledges that the company is prospecting. An experienced mining man who recently visited the property says that the company will soon require additional milling facilities. The claim consists of 500 acres of land containing five developed ledges.

CENTENNIAL.—*Transcript*, Nov. 22: Supt. Baker was down yesterday from the Centennial mine in Washington township. The new pump was started Tuesday, but did not raise the water well. Shortly after his arrival he got a telephone message that it had stopped "bucking," and was working finely. Eight men are now employed in putting the shaft down to bedrock.

MERRIFIELD.—The Merrifield mill began crushing Tuesday. Work will be pushed in all parts of the mine as fast as practicable, the force of miners being increased from time to time until the full quota is again "on deck."

CANADA HILL.—*Tri-Weekly Herald*, Nov. 24: Considerable quartz mining is being done in the district and the prospects are encouraging. Excellent ore is being taken from the Charonnat mine, the clean-up from one week's run of the mill recently being sufficient to pay a full month's expenses. In a short time the machinery will be running by water-power. Chris. Weisenburger and Artbur O'Hearn have entered into a contract with the Charonnat Company to take out 100 tons of quartz from a ledge near the Charonnat. They have struck some very fine looking rock. Samuel Barr is working a ledge that prospects well. Lately a streak of very rich ore was met with, which increases as work progresses.

Placer.

RIVER MINING.—*Argus*, Nov. 22: Our friend Boles, who is mining in the bed of the American River near Rattlesnake Bar, is getting a little anxious about the weather. A fortnight or so more of fine weather would be worth thousands of dollars to him. He has had a large number of men at work for over 2 months past damming and fluming and doing other necessary work, preparatory to getting down into the crevices and rich pockets on the bed of the river. This work could not be done before a certain date, rather late in the season, when the water is pretty low down, and then every thing has to be done in a hurry. Should the rains come now before Mr. Boles has had a chance to clean up, his work would be all in vain, as it would sweep his improvements away and leave him about $4,000 out of pocket. Two or three years ago his first day's clean-up was no less than $3,000. Last year and the year before he was washed out.

Plumas.

INDIAN VALLEY.—Greenville *Bulletin*, Nov. 21: All the miners at the Indian Valley were stopped from work on Monday. The flow of water in the bottom of the shaft had increased so much that it could not be kept down by bailing with buckets, and at present no other means are available. The bottom of the shaft is in much better ore than any before found in the mine. The mill will be stopped by Friday. It is not known how long operations will be suspended, but in all probability as soon as water for power is supplied work will be resumed.

ELIZABETHTOWN.—Loring and Leavitt are reported to be taking out from $200 to $400 per day to the pick in their claim at Elizabethtown. They are working on the lower end of the claim, next to the ground now being prospected by Russel and Davis on the O'Neil ranch.

RUSH CREEK.—During the past thirteen years John Martin has been prospecting at the head of Rush Creek from time to time. He has put down several shafts to a depth of about 160 ft average, and is now running a tunnel that will cut two quartz ledges that crop out higher up the mountain, though his main object is to strike the old gravel channel. The ground looks well.

SOUTHERN EUREKA.—At the Southern Eureka it is expected the mill will be started up next Monday. J. W. McCartney is now at work getting the mill in complete order, and T. J. Hanson is putting to rights the engine and boiler. From present appearance a successful run may be expected.

San Bernardino.

IVANPAH.—*Index*, Nov. 24: J. A. Bidwell, of Ivanpah, called at this office last evening, and was interviewed as to the prospects of the mines at Ivanpah. The principal of the group of mines at Ivanpah is the Lizzie Bullock, of which Mr. Bidwell is the owner. He has employed 13 men on this mine and in his mill, and the mill is kept running with the ore from his own mine, and the old Consolidated, Alps, Eugene and Stonewall mines, all of which are being worked. Mr. Bidwell has an 8-mule team constantly hauling supplies from Fenner station on the railroad 70 miles distant. He reports that all the mines are looking well. In his own mine, the Lizzie Bullock, he has just struck the main ledge at a depth of 315 ft. It has taken over ten years to work about 300 ft square, and this latest strike places at his disposal more than twice the amount of the same rich ground, and the bottom is not yet reached. Two hundred ft below the 315 ft level he has a good body of ore.

CALICO NOTES.—*Print*, Nov. 24: On the Sue, J. B. Osborne has three men at work who have a contract to run a tunnel 50 ft at $8 per foot. They are now in 40 ft. There are also two men at work sinking a shaft at the bottom of the gulch for water. They are down 15 ft, at which depth the gravel is becoming wet. The Josephine, owned by Fay and Lawrence, of the Toll Gate, leased by Soule and Stevens, has two men at work running a tunnel in the ledge. They are in 15 ft. The Mountain Brow, owned by Sparkule, has three men at work. At the Red Jacket there are six men at work under J. B. Ferrell. They are working in the tunnel connecting with the shaft above the Mammoth. Two men are working on the Silver Odessa, and are finding some good ore which is being sacked for shipment to the Alhambra mill at Hawley's station. The usual men are at work at the Garfield, Runover, Bismarck, Humbug and the King, and Calico mining district altogether has better promise to-day than ever before

Sierra.

FLORENCE.—*Tribune*, Nov. 22: This claim is 2 miles west of the famous Keystone mine, on the ridge above Sierra City. The Florence ledge was worked to some extent 20 years ago, and ore was worked in an arastra that yielded as high as $70 per ton. At present there is a 4-stamp mill on the property. A tunnel has been run that will tap the ledge 200 ft below the surface when the pay chimney is reached. The ledge will average 4 ft in width and is a true fissure vein. The owners are Wilcox, Mooney & Hutchinson, of Sierra City, and S. R. Stephenson, of Forest City. The latter gentleman was in San Francisco a short time ago, and bonded the mine to ex-Lieutenant Governor Johnson until the 1st of January.

RUBY.—Supt. Coleman was over from the Ruby mine last Friday and reported the following: The incline is down 12 ft below the main tunnel and in splendid paying wash gravel. The working force will be increased to 20 men next week, and the week after 2 gangways will be started on the channel. Mr. Coleman feels highly elated over the encouraging developments.

WISCONSIN EXTENSION.—P. Grant, one of the owners in the Wisconsin Extension gravel mine, informs us that softer rock has been encountered in the upraise, about 20 ft out from the face of the main tunnel. The Wisconsin tunnel has been run in a distance of 2,200 ft, through hard rock, at a cost of $56,000. The entire work has been wholly of a prospective character, and has been carried on by comparatively poor men.

NOTES.—James Nelson is putting things in shape to start up work at the Tippecanoe mine, near Pike City, as soon as water comes. It is expected that the mine will yield handsomely this season. The usual force of men are being employed in the Bald Mountain mine. At the Honeycomb quartz mine, near Camptonville, Messrs. Arnold & Ogden are preparing to resume work with an arastra. There has been considerable work done on this mine in years past; but it was done in a desultory manner, and the real merits of the ledge have never been tested. If the developments made are sufficient to warrant it, a mill will be erected in the spring.

Siskiyou.

DEADWOOD.—Cor. Yreka *Union*, Nov. 22: Every thing looks flattering for this section of the country. Warnaka & Co.'s arastra started up 1 week ago on ore from the Little Willie mine. This mine is owned by Messrs. Warnaka, Nason & Fyfield, and is the oldest location in the district. Ore from the mine has worked as high as $40 to the ton. The mine is stripped on the surface for a distance of 250 ft, showing a continuous vein from 1 to 2 ft in thickness, and free gold can be seen in nearly all the ore. Tunnels have been run into the mountain a distance of 50 ft, cross-cutting the vein, and the owners estimate 1,000 tons of ore in sight. Pyle & Co., on the East Fork, have 1 mile of ditch completed, a nice house built, an arastra fast approaching completion, and they expect to be crushing ore within 2 weeks. Mr. Thomas is working his placer mine on McAdams Creek with good success, running only a day force. Both shafts on the Oak Grove claim are paying better than for several months past. This mine is owned by Lincoln & Co., and they employ a force of 25 men. On Indian Creek the quartz mines are paying well. The Grizzly have taken out some very rich rock within the last week.

Trinity.

WILLSHIRE MINE.—*Journal*, Nov. 24: Eddie Wallace was up from Big Bar this week, and informed us that his father has completed preparations for working the Willshire mine. It is probable they will not have to wait long for water.

Tuolumne.

THE MOTHER LODE.—Sonora *Democrat*, Nov. 24: The section of the mother lode beginning at Rawhide and running below Jamestown to the bank of Woods' Creek can every foot of it be profitably mined. For several miles the lode averages 60 ft in width, and the rock will yield in the mill, worked in bulk, from $3 to $6 per ton; and anywhere in this section the rock can be mined and milled at an expense of a dollar a ton or less. The only man in Tuolumne County who has furnished a practical example of what can be done in mining the slates to the east of the mother vein is W. N. Harris, of Jamestown. A little more than 3 years ago he bought the Alabama mine, and erected a 40-stamp mill on it. With this mill he is able to mill and mine 80 tons of ore every 24 hours with a force of 12 men. The total expense involved in extracting and crushing is less than $1 per ton. The actual results have been a yield of from $2.50 to $3.75 per ton. To accomplish his success Mr. Harris had his mill constructed with an especial view to saving all the labor possible. Nothing that can be done by machinery is done by hand. The power for the mill is furnished by a Knight water wheel, which is run by water bought from the Tuolumne Water Co. Water costs $23 per day. This amount is included in the stated expense of milling and mining. Although $3 per ton looks almost like nothing, it does not demand any great intelligence to perceive that a practically inexhaustible deposit of $3-ore which can be worked at an expense of $1 per ton is a magnificent bonanza. The men who will mine the mother lode must construct a complete system of reservoirs and ditches, so as to obtain an unlimited and never-failing supply of water power.

NEVADA.

Washoe District.

HALE AND NORCROSS.—*Enterprise*, Nov. 24: Some good ore has been developed in the north branch drift on the 2700 level. There has been no increase of water, though care has been taken not to cut across the stratification. The drifts from the F street tunnel are making fair progress north and south.

UNION CON.—The south drift from the 3100 station is passing through streaks of good ore alternating with seams of stained quartz (highly silicified porphyry) of no value. The drift has not yet reached the main ore streaks cut through in sinking the winze. The double cages have been put into the joint winze.

IMPERIAL.—The west drift from the 600 station is being pushed as rapidly as possible for the works in the old upper level. Once this drift has reached its objective point, explorations will be commenced in the old ground of the Alpha, Exchequer and Imperial.

ALTA.—All in the works and shaft is now in first-class order. The 2150 level will be drained in a few days, when it will not be long before active prospecting operations may be resumed.

GOULD AND CURRY.—The joint Best and Belcher winze that is being sunk below the 2500 level is down about 75 ft. The ground has been of a soft and swelling character, but is now harder. The bottom is now in quartz of a fine appearance, but as yet it carries no metal.

SIERRA NEVADA.—The upraise from the 2900 level is being advanced at the rate of about 15 ft per week, in dry and favorable ground. On the 3100 level a north drift will be started in a few days from the joint Union Con. station at that point.

BEST AND BELCHER.—The joint Gould and Curry winze is being sunk and timbered at the rate of about 15 ft per week. It is now about 75 ft deep. The ground has been soft, but is now showing quartz of good appearance.

COMBINATION SHAFT.—The new hydraulic pump is completed, and as soon as it is tested it will be shipped to this city. All here is in readiness to receive the pump, which can be set up in 10 days after arrival.

MEXICAN.—The north drift on the 3100 level will probably reach the Union Con. line to-day. When it reaches the line the Union Con. Co. will pay for its further advancement.

CROWN POINT.—About the usual quantity of ore is being extracted and shipped to the mills on the river. Some work is being done in the way of exploring for new deposits of ore at various points.

ANDES.—The face of the north drift still continues in quartz of a promising appearance. The south drift from the winze is in quartz that gives promise of ore.

BELCHER.—Some ore is being extracted, and the amount will be gradually increased as additional stamps are put in operation in the mills on the Carson River.

CALIFORNIA.—The joint Con. Virginia winze on the 2700 level is being sunk and timbered at the rate of about 12 ft per week.

CON. VIRGINIA.—On the 2700 level the joint California winze is being sunk and timbered at the rate of from 10 to 12 ft per week.

YELLOW JACKET.—About 100 tons of ore per day are being extracted, and a good deal of work in the way of exploration is being done.

UTAH.—Good progress is making in the work of retimbering and repairing the main incline below the 1350 level.

OPHIR.—Are still extracting some low-grade ore from the 150 level. It is nearly all in the shape of old fillings.

UNION SHAFT.—The work of cutting out behind and easing timbers at the 2300 station is still continued.

OVERMAN.—Some low-grade ore is still being extracted from the old upper levels.

SCORPION.—The west drift on the 500 level is still being advanced.

Belmont District.

BELMONT MINE.—*Courier*, Nov. 17: The Belmont mine is still looking splendid, and the work of development is pushed ahead with energy. The following is a copy of the superintendent's letter of November 17: "All stopes in south tunnel are yielding an abundance of good ore. No. 1 level in Laity ground has been extended south during the week in the gouge 20 ft. Winze No. 1 south of Highbridge shaft is now down 40 ft; ledge somewhat broken. We are opening a new level in Moore and Martin ground, now down 40 ft. The stope in this ground is looking well. The mill is working 24 tons per day, and is doing splendid work.

NOTES.—We learn that the Tybo mill will again start up as soon as repairs are completed. The working force in the 2-G mine has been reduced, and it is said that the work of development will be performed by contractors next winter. Garrard, Robinson and Wilson are preparing to run a tunnel in their mine at Jefferson. The prospects are good for striking pay ore. Work in the Seventy-seven mine is progressing as usual. The Belmont Mining Co. is now shipping bullion. Green Aldrich will soon have the Emerson mill and leaching works running in full blast. Charles Kanrohat is still working his mine at Jefferson with flattering results.

Esmeralda District.

MT. CORY.—Hawthorne *Herald*, Nov. 17: Nothing new has transpired at the Mount Cory mine or mill since our last issue. The heaviest machinery is now arriving.

AURORA.—John and Horace Poor and George D. Clark are having the ore from the H. V. Poor mine

worked at the Silver Hill mill, and John Neidy is superintending the crushing. Handsome returns are expected.

Paradise District.

PARADISE BULLION.—*Silver State*, Nov. 21: J. V. McCurdy shipped from the Paradise Valley mill, yesterday, 1 bar of bullion of the assayed value of $2,555.18. It was almost pure silver, and was one of the handsomest bars ever shipped from the Paradise mines

Peavine District.

GOLDEN FLEECE.—Reno *Gazette*, Nov. 20: The Golden Fleece Mining Co. started work on their property at Peavine last week. They have encountered a new character of ore. It is of a greenish color, resembling the J. & K. rock at Pyramid. General Clark visited the mine yesterday, and was well pleased. The body of ore in the "new find" is inexhaustible. The miners have also encountered a large body of water. Work has also been commenced on the Poe. The two men struck a seam, which they followed up 15 ft, when it widened out to 2 ft, the bottom and sides of the drift being in good ore.

Ploche District.

CHIEF.—*Record*, Nov. 17: There were recently 5½ tons of ore around the old mine dumps in Chief district, and sent to the Dry Valley mill to test. The ore went $35 in silver and $33 in gold; total $68. Ore gathered up at the old dumps of this now abandoned district, about a year ago, went about the same as this last lot. The gold can not be extracted by mill process, but by chloridizing and roasting it may be extracted. The ore in Chief district will average $20 or more in gold. The contemplated railroad through this county will run right by this district.

COMET.—The boys at Comet district continue shipping in small lots of rich ore. Those who have worked their claims in this way have been able to keep working and paying expenses as they went along.

INDIAN.—The work at Indian district has ceased for the winter. There has been a few tons of ore that will work $150 per ton sacked, and it will be brought into Bristol.

MENDHA.—There is some very rich ore being extracted from the Mendha mine at Highland. Teams have hauled considerable ore to the furnace within the last few days.

DAY.—Teams are hauling ore from the Day mine to the furnace at Bristol, but the furnace will not start up till there is a large quantity of ore and flux at hand. Supt. Grim is pushing matters as rapidly as convenience will permit, but it will probably be some little while yet till the furnace is started.

KINGFISHER.—The Kingfisher claim has greatly improved the last week. The men engaged in running on the tunnel level recently encountered a ledge of solid ore of a dark carbonate. The assay from the sample sent to town went $171 in silver and 25 per cent lead.

Pyramid District.

PYRAMID MINE.—Reno *Gazette*, Nov. 21: This is the coming camp. The ore goes $200 per ton in copper and silver besides sulphur. The papers reported that it went $400 the other day, but it had not been assayed then. It is like the ore near Smartsville, California, except that it contains silver and is richer in copper. It can be worked for $25 or $30 a ton if suitable works are erected, which Mr. Kinkead thinks will not cost over $10,000 to build. The freight to Denver is $40 a ton, so that a very few car-loads would buy the furnace and build the works.

Tuscarora District.

ELKO CON.—*Times-Review*, Nov. 15: Since last report the station at the 200 level of shaft No. 2 has been completed. Will extend the shaft a few feet for a sump, after which will immediately commence crosscutting.

ARGENTA.—North cross-cut, 400 level, is in 198 ft; progress for the week, 15 ft. The ground is looking more favorable.

GRAND PRIZE.—The raise above the 400 is up 82 ft and in good ore. Stopes above the 300 producing usual amount of ore. South drift on 400 level is in 114 ft; progress during the week, 24 ft. Ledge is large in face of drift. Mill was started Monday morning and is working very well. Pulp assays so far have averaged $224 per ton.

BELLE ISLE.—*Inter-Mountain*, Nov. 6: North drift, 450 level, has been extended 21 ft. Upraise, 350 level, has been carried up a total distance of 43 ft.

NAVAJO.—Started to milling yesterday. Everything at mine and mill running smoothly. Stopes on the different levels are making the usual output of ore.

INDEPENDENCE.—Total length of No. 1 cross-cut, 300 level, 83 ft. Progress 21 ft. Cross-cut No. 2 has been extended 14 ft; total length 48 ft. No. 3 has been advanced 23 ft. Progress 11 ft. Main drift north has been extended 6 ft; total length 891 ft.

NORTH BELLE ISLE.—Good progress has been made in cutting out station at top of upraise at the connection with Belle Isle. This work will be completed and timbered in a few days. Then the outlet will be through this connection to the Navajo shaft, and the expense of running the upper works will cease. The siphon to drain this level works successfully. Will commence sending ore to the mill within the next 10 days.

White Pine District.

NOTES.—White Pine *News*, Nov. 17: The Smoky mill suddenly shut down Friday evening, cleaned up Saturday, and we are not likely to hear its whistle again till spring. Col. Grandelmyer, with the force in his employ, are doing assessment on various claims. The Colonel devotes all his time to superintending the work.

ARIZONA.

TIPTOP.—Prescott *Miner*, Nov. 16: An attachment has been placed on the Tiptop mine and mill for $1,000, with interest at 9 per cent per annum, from Oct. 23, 1883, in favor of Samuel Goldwater, of this place. So far no attempt has been made by the company to settle it, from which it is to be inferred that the property is to be abandoned.

GROOM CREEK.—The parties who have been sinking 100 additional ft on the Chicago mine have completed their contract, and the company is now running levels—working three shifts constantly. The mill will be started up on Tuesday, and kept constantly running.

MORE FROM GROOM CREEK.—A. J. Rupert yesterday showed us some specimens of free-milling gold quartz carrying a large amount of gold. The samples came from his claim on Groom Creek. The first discovery is called the Flora, while the extension is called the Lincoln. Mr. R. also owns an eighth interest in the Golden Chariot, near by, a gold mine with a vein not quite so wide as the Flora, but carrying very rich ore.

GIPSY.—Globe *Chronicle*, Nov. 17: The outlook for the Gipsy mine is very promising. A shaft down 105 ft seems to have struck the northeast point of a large chimney of high-grade ore. Drift No. 1 at the 30 level, running in a southwest direction, is now in 15 ft; Drift No. 2 at the 105 level shows even a stronger vein. The entire workings show a strong vein of rich milling ore. At present this is one of the most promising prospects in the district.

OWL HEAD.—Pinal *Drill*, Nov. 17: The Owl Head mines under D. T. Elmore are under full headway. There is a large body of excellent ore in sight, and every thing indicates prosperity beneath the Owl Heads.

CONCORD.—Judge Taft has struck very good-looking quartz on the Concord. The ledge was struck at a depth of 100 ft, is 4 ft wide, and looks well.

PROMISING.—Above the King, along the line of the lower edge of the first lime belt, there are several highly promising mines; we spent a day amongst these hills. The furthest mine on the belt is the Surpriser. The ore is all of the same class, block galena carrying silver and apparently some zinc, and is very rich. There are several quite large dumps of ore.

TOMBSTONE.—*Epitaph*, Nov. 18: A very important strike occurred in the Mammoth mine during the last week. The main incline shaft is down 270 ft, and at this depth the new ore-body was encountered. The ore is higher in grade than any encountered in this mine before.

GIRARD.—A small force of men is cleaning up the dumps and getting the ore ready to be shipped to the Boston mill. The mine will be shut down for the present. Mr. Fee, the superintendent, assures us that the mine is in splendid condition, and plenty of ore in sight ready to be taken out.

COLORADO.

EMPIRE.—Georgetown *Courier*, Nov. 15: We learn that the old Jones or Knickerboeker mill will soon be started up again. The dam will be repaired, and a new wheel and works throughout put in, with 20 stamps and a concentrator attached. They have one of the best gold lodes in the country, the Tenth Legion, a lode we worked nearly two years, and know whereof we speak. This mill was built 20 years ago, by G. W. Hall, for John S. Jones, and has always paid up to the time the dam washed out, two years ago. It is one of the finest water-powers in the country, and able to run 40 stamps day and night. 20 stamps will crush from 1½ to 2 cords of ore every 24 hours, or from 11 to 15 tons every 24 hours. Two men can run it at a cost of one dollar per ton.

NEW YORK AND COLORADO CO.—The New York and Colorado Co. are building one of the finest mills ever built in the State. It has the best machinery I have ever seen in Colorado. Every thing is being done in the most substantial manner. The mill building is large and well put up. The engine is a Corliss of 75-horse power, with two boilers of 40-horse-power each. It has 50 stamps, with 10 Frue vanners for concentrating the ore.

SEVEN-THIRTY MINE.—This property continues to ship high-grade ore. The shipments of the 1st, 2d and 3d of this month amounted to $2,200, the first-class ore milling 808 ozs. silver per ton, and the second-class from 107 to 209 ozs. Between 40 and 50 men are employed, and new ground is daily opened. Five drifts are at present being run—three on the west and two on the east of the main shaft. All are in mineral.

SILVER PLUME.—*Gazette*, Nov. 17: In the Baltimore tunnel the Co. is sinking a pump in the lowest level to collect the water, and as soon as this is completed a party of lessees will commence sinking the Baltimore shaft to a depth of 60 ft, from which they will drift east and west. There is a streak of 2 to 3 inches of 500 to 700 oz. ore in the shaft to commence on.

HUBERT MINE.—*Miner*, Nov. 17: Three men extracted last week, in the Hubert workings, twenty tons of smelting ore, averaging about $60 a ton, and about 60 tons of milling ore averaging from 4 to 5 ozs. per cord in gold. This lode was discovered in 1862, and the surface worked by prospectors with large returns. It has lain idle, however, for many years, owing to lack of finances on the part of the owners.

RICH ORE.—The Boulder *News and Courier* says that Emmet Rea has been working in the Senator Hill mine at Magnolia, and last week shipped, aside from a quantity of other ore, several pounds of first-class ore which runs 1,200 ozs. of gold or $24,000 per ton.

IDAHO.

ATLANTA.—*World*, Nov. 16: J. D. Heath came down from Atlanta last week for the winter. His latest strike is in the Washington lode, and bids fair to excel all others he has had a hand in developing. During the past summer he has driven a 284 ft tunnel, and about the 1st instant crosscut a 4 ft vein of exceedingly high grade ore. Mr. Heath has in his possession specimens worth $1 per pound, and it is known that the entire ledge will return a yield of several hundred dollars per ton. The ledge was tapped at a depth of 150 ft from the surface.

BANNER.—The stamps of the Banner ceased to drop Wednesday morning, but the "clean-up" will occupy several days. Until then the exact product of the 4 months' work can not be learned, but it will be near $120,000. Operations in the mine will be continued all winter.

MERRIMAC.—Wood River *Times*, Nov. 14: Capt. Stowe has come down from the Merrimae mine, on Lake Creek. He reports the ore vein 3½ ft wide, of good ore, but does not know how wide the ledge is. There being 2½ ft of snow at the mine, on a level, work has been discontinued for the present. It will be resumed in the spring.

BLACK HORSE MINE.—Ketchum *Keystone*, Nov. 14: Mr. Floyd, the superintendent, says that the Black Horse never presented a better appearance than at present. A fine body of ore 70 ft long is developed in the main tunnel. The first-class ore runs as high as 130 ounces in silver and 66 per cent lead, value, $175, in 20-ton lots. The second-class assays 57 in silver and 37 in lead. The shipment of ore continues to the smelter, and will not cease till roads are impassable. Winter supplies have been shipped to the mine.

BAYHORSE.—Ketchum *Keystone*, Nov. 17: Seventy-five miners on the Ramshorn mine at Bayhorse were recently discharged because of too abundant yield for the smelter. Sufficient ore is now on the dumps to run the smelter another month, at the end of which time it will close for the winter. The Ramshorn smelter consists of two 50-ton stacks, which have been in operation during the greater part of the summer and fall. The Ramshorn ore is very high grade, assaying from 200 to 300 ounces in silver with a good per cent of lead per ton. The bullion yield of the smelters has probably averaged about 15 tons daily for several months past.

MULDOON.—A force of 15 men was recently put to work on the Muldoon mine, and winter's supplies laid in. In the lower works remarkably rich carbonates have been struck containing sufficient iron to make the ore very free smelting. It assays 125.5 ounces in silver and 37 per cent lead.

MONTANA.

CATARACT DISTRICT.—*Inter-Mountian*, Nov. 16: Foster & Harper are the owners of 3 leads—the Boston, Buckeye and Wolverine. Assays from the float at the Buckeye give a return of 70 ounces. The lead is opened by a shaft 23 ft deep, and a tunnel being run to tap the vein at a depth of 50 ft is in 70 ft. It is thought the tunnel will reach the main ore body in 50 ft more. The Boston has been sunk on 36 ft and assays from the bottom give 65 ounces silver and $12 in gold. A tunnel has been started, which will tap the lead at 75 ft, and will have to be run about 80 ft. A water diteh near the mouth of the shaft keeps it full of water. The Wolverine has a 20 ft shaft and assays 40 ounces. The district is 25 miles from Butte. The location of the mines is like those of the Summit Valley. Any property in the district can be approached in a buggy. The Cataract district is 3 miles west of Comet, Jefferson County.

SHONBAR.—*Inter-Mountain*, Nov. 17: Joe Lacaff is jubilant in consequence of an important development in the Shonbar. The shaft was recently sunk to the 300 ft station. Since then a drift has been extended east on the vein 150 ft, following a body of ore 4 ft wide and assaying $35 per ton. A few days ago a body of tale was penetrated, and extension a few feet further disclosed the west extremity of what is evidently a very much richer shoot of ore, and which, it will be remembered, was opened in the 220 level, for a length of 200 ft, with splendid results. The new strike is 3 ft wide and samples $100. It can be sorted, however, up to the value of $325. The company is now working 14 men, has 2,000 tons of $40 ore on the dump, has produced $100,000 in the last 15 months, and has a complete hoisting and pumping plant.

MOUNTAIN VIEW.—Chas. N. Larabie is now in a fair way to open up one of the biggest copper mines in Butte, a mine which there is little doubt is an extension of the famous Anaconda. Already it is stated the workmen in the St. Lawrence can hear the blasts in the Mountain View. Mr. Larabie has spent a great many thousand dollars on the Mountain View, against the advice of some of his friends. He has sunk a shaft 500 ft deep, and lately has struck a fine grade of copper ore in the south 300 ft cross cut.

NEW MEXICO.

CARLISLE.—Southwest *Sentinel*, Nov. 14: The Carlisle is the biggest mine yet discovered in Southern New Mexico. The ore which is now being extracted comes from an open eut on the surface. We are informed that this eut now shows a breast of ore 50 ft from top to bottom, and 30 ft or more in width, all of which pays well. This is certainly a phenomenal body of ore, and not equaled by any other property in Grant County. Aside from this vast ore-body, the mine is opened to a depth of 300 ft, where it shows equally as well as on the surface. The ore here is not only rich in gold but also in silver. The regular product of the mill is nearly $40,000 per month, and yet the mill is only run to half its eapacity, the supply of water being short.

FLEMING.—Jack Fleming expects to make a clean-up the latter part of the week. He estimates the produet of the run so far, which does not exceed three weeks, at from $8,000 to $10,000.

The Southwest *Sentinel* of the 17th says: The Fleming mill has never stopped once since it was started up, and is crushing daily 18 to 20 tons of ore. The work of cleaning up the pans has been going on for several days, and several hundred pounds of amalgam have been obtained. Retorting will begin to-night.

TELEGRAPH DISTRICT.—Crawford, Bradley & Co. are now the sole owners of nearly all the important properties in Telegraph district. The Mother lode is probably the best mine in the group, and at the bottom of the 170 incline the vein is 5 ft in width, and is yielding 40-ounce ore. From one of these mines two men recently took out 8 tons of 300-ounce ore within a week's time.

NEW YORK AND NEW MEXICO CO.—Silver City *Enterprise*, Nov. 16: The mines adjoining the Bremer, on which Colonel Waller contemplated such extensive operations previous to his death, are to be opened up by the New York and New Mexico Mining Co., represented here by Mr. D. McDonald. The company have 4 claims which are on the same contact as those upon which Mr. Bremer is working, and which have produced so handsomely during the past year. Hoisting machinery is being erected preparatory to continuing sinking on the shaft of the Hidden Treasure which has attained a depth of 100 ft.

CEDAR GROVE.—The Red Warrior, Cedar Grove and Viola are owned by C. C. Clark, H. Gudgeon and P. Gunning. They make up the group upon which most of the work has been done, and are now being actively developed. The Red Warrior is opened with a 15 ft shaft on the vein showing ore in an 18 inch streak, the vein being much wider. Other surface openings show the ore and vein to be continuous. The Viola has a 60 ft shaft which, at a depth of 12 ft from the surface leaves the ore, the latter pitching easterly. A quantity of high-grade ore has come out of the shaft, chloride and sulphide of silver showing in much of it. A lot of unassorted ore from there, shipped away for the purpose of having an average run made, gave returns at the rate of $300 per ton.

OREGON.

NOTES.—Jacksonville *Times*, Nov. 16: William Scott of Gall's Creek informs us that the miners of that section are all ready for water. McCall & Anderson have purchased S. Dale's mines, on the east side of Bear Creek, and put some hydraulic pipe on them. Huston & Hosmer of Foot's creek are making extensive preparations, and propose putting a giant and plenty of pipe on their claims. Miller & Kretzer, who have large mining interests on Farmer's Flat, are ready to commence piping. They will operate on an extensive scale. Jack Layton was in town this week. He has been piping some, but water is yet too scarce to mine advantageously. A Waldo correspondent says: Wimer & Sons will commence piping with 2 pipes in a few days. Simmons, Ennis & Co. are pushing along rapidly. Bybee & Co. are ready to run, as also are DeSelles & Co.

UTAH.

OSCEOLA.—Cor. Southern Utah *Times*, Nov. 17: The Osceola Co. are getting along finely. Their 20 stamp mill is nearly completed and will commence crushing ore before the first of December. The company's property consists of 2 mines, the Credit Mobilier and Fort Wayne. The Credit Mobilier has 3 parallel and distinct ledges cropping out upon the surface. The lower ledge, where the hoisting works are ereeted, has a shaft upon it 235 ft deep. At that depth the ledge is 5½ ft wide, free gold quartz. At a depth of 200 ft a drift has been run which euts the middle ledge 90 ft from the main shaft. This middle ledge is 7 ft wide and is good ore, some of it working as high as $500 per ton mill process. The third ledge is further up the hill, about 100 ft from the middle ledge, and shows 10 ft in width on the surface. The Fort Wayne is simply immense, the croppings being something over 80 ft wide, with free gold plainly exposed to the naked eye. The company is working 23 miners at present and will increase their force to 50 when the mill begins to crush.

BONDHOLDER.—The Bondholder, owned by Stead & Gregory, is a well defined ledge of 1500 ft, showing from 3 to 7 ft wide of quartz assaying from $6 to $40 per ton.

SILVER KING.—The Silver King is the first northwest extension of the Fort Wayne. It is a large well defined ledge carrying free gold and going high in silver, some of the ore showing horn-silver. The Silver Queen, owned by the same parties, adjoins the Silver King, and shows a well defined ledge of same character of ore.

UINTAH.—Park *Mining Record*, Nov. 17: The Uintah has a number of men at work on their 2 tunnels prospecting and running for the vein. The upper tunnel is now in the foot-wall, and the rock is mineralized heavily. The developments are being made under the direction of W. P. Blaek, who has spent several years in Colorado. He thinks Park City has a brighter outlook as a carbonate camp than Leadville.

CRESCENT.—Park *Mining Record*, Nov. 10: During this year the mine has made a splendid record, as the following figures will show: Receipts—Ore sales, $348,000. Expenditures—Dividends, $150,000; purchase of Walker & Webster, $50,000; permanent improvements and property on hand, $148,000; total, $348,000.

ONTARIO.—The shaft at the No. 3 Ontario works has reached a depth of 855 ft, and the work of cutting the stations is to be commenced at once. There are to be 3 at that level—a pump-bob, tank and working station.

WASHINGTON.

COEUR D'ALENE.—*Oregonian*, Nov. 16: Following are extracts from a letter by O. A. Tibbetts to his brother in Portland: "Pritchard Creek is located for 20 miles, Eagle Creek for 12, and Beaver Creek for 15 miles. When I left, Pritchard Creek was the only one that had been prospected, and that not thoroughly. They were sluicing in four different claims, all averaging over an ounce per day to the man. In one claim five men in three days took out 31½ ounees, and the day I was in the claim they picked up over $30 in nuggets while cleaning the bedrock. At this time they were working over rough bedrock, and in a few days they ran on to smooth bedrock, when seven of them only cleaned up $10. There is no plaee where they go to bedrock on the three creeks but what they find very flattering prospects. The gold is very eoarse, none of it running less than 50 cents, and I saw one piece which went $38.40. They found a piece recently which weighs a trifle over $156, and a large number of nuggets have been found ranging from $6 to $20. When I left the eamp there were about 500 or 600 men on the crecks, and I met 80 on their way in. The eamp has been visited by something over 1500 men, but probably not more than 200 or 300 will winter there. As soon as the spring opens there will be the greatest rush ever known on this north Paeific Coast. I will not be surprised to see 15,000 men on the ground by July 1st. The exeitement amongst old miners is intense, and they are sending for friends far and near, and even should the pay not extend over all the ground the rush will be just as great, for it will not be thoroughly prospected this season. They have located three galena veins running northeast from Beaver Creek, the best of which goes $25 gold, 30 ounces silver and 47 per cent lead; and due east from there they are sinking on a ledge that shows a sampling as high as $900 gold.

The Bedrock *Democrat* of the 15th says: The mines are in Shoshone County, but near the boundary line of Kootenai. This is a very aggravating feature of the situation, for, in order to reach the county seat, Pieree City, to record claims, a journey of 250 miles via Lewiston must be undergone. The mines are about 65 miles north of the old government highway known as the Mullan road, and 45 miles north of the old Cœur d'Alene Mission. This would make it about 70 miles from Rathdrum, and between 90 and 100 miles northeast of Spokane Falls.

Intra-Mercurial Planets.

[Read before the California Academy of Sciences, by GEORGE DAVIDSON, U. S. Coast and Geodetic Survey.]

Truvelot's Red Star.

The scientific journals bring us items from the reports of M. Truvelot, who accompanied Mr. Jannsen to the Caroline Island to observe the total solar eclipse, of May 6th, 1882.

The members of this Academy will recollect that Jannsen and his associates were invited to our meeting. Messrs. Palisa and Tacbini and Rockwell were absent. All these gentlemen had been observers of the eclipse, and some of them bad specially directed their attention to the question of intramercurial planets. No one had seen any sign of these bodies, but M. Truvelot made known to the Academy that at the time of totality he had seen a star—a red star—of the fourth magnitude about three degrees north and three degrees west of the sun, and that the star had no definite disk or appreciable phase. He had had no opportunity to consult star charts, and therefore he could not pronounce judgment upon its being a star or an intramercurial planet.

The next day I placed the sun in its proper position on the star charts of Aydander, and then found *d* Arietis, of the fourth magnitude, situated two and three-fourths degrees north and two and three-fourths degrees west of the sun. I had to be absent during the day, but M. Truvelot came and examined the charts and my location of the sun. To my mind there was the solution of M. Truvelot's red star. But *d* Arietes is not a red star, and we can only suppose that there were such conditions present as gave to the star a reddish hue, or that M. Truvelot sees objects red where other observers do not.

I have been thus particular about details because we now read published statements that are somewhat different. It is mentioned that he saw a decidedly red star "a little to the north and a little to the west of the sun." He, moreover, is reported to have stated (Nature, page 546) that on September 5th and 7th he examined the part of the sky where the sun was then situate, with a telescope of the same aperture that he used in observing the eclipse, and with the eye-piece then employed he recognized the two white stars which he had noted as 41 and *e* Arietis, but the red star was not found, even though he swept to a much greater distance than any probable error of his observation would allow. On this circumstance he remarks:

"As much as the absence of a red star as brilliant as that one which I observed during the eclipse seemed naturally to lead me to suppose that the star in question was not other than an intramercurial planet, nevertheless, as the most necessary elements—such as the position, and a disk, or a sensible phase—failed to my observation, I believe that it is my duty to hold my opinion in reserve, and for the present suspend my conclusions upon the possible nature of this star."

With regard to the reference to the stars 41 Arietis and *e* Arietis, respectively of the 4th and 4½ magnitudes, it need only be remarked that they were not in or near the region of the reported red star. The former star was 10¼ degrees north of the sun and 2½ degrees to the east; the latter star was 4¾ degrees north ½ a degree east of the sun. They may be thrown out of the case, except as indicating that he saw them, probably with the naked eye, as he could hardly be looking in that locality for an intramercurial planet. Two or three stars of this constellation, but of the 5th and 6th magnitude, lay from 1½ to 3 degrees to the north and west of *d* arietis, but they do not appear to have been seen.

We are therefore reduced to the consideration of *d* Arietis as being the star which M. Truvelot saw. At our meeting he named the estimated distance of the observed star from the sun, and this estimated distance almost exactly tallies with the position of *d* Arietis; and the observing 3 deg. west and 3 deg. north are represented by 2¾ deg. west and 2½ deg. north; the estimated magnitude agreed with the actual magnitude; and the absence of disk and of phase agreed with the observer's statement that it was a star.

In my judgment but one condition remains unsatisfied, namely, that it was a red star. And it seems to me not unlikely that there may have been atmospheric or possibly cosmic conditions in that vicinity which gave the star a reddish hue; or that he may have a tendency to see an object with a reddish tinge. The seeing 41 and *e* Arietis as white stars might militate against this view. But in M. Truvelot's great atlas of astronomical drawings, and in his drawings of sun spots, in the Cambridge Annals, we can not help noting that his red spot on Jupiter is very brilliantly red as compared with the appearance to most observers; and in some of the sun spots we find a reddish tint added to the blackness of the dark centers, the same reddish tint not being visible to other observers. It would be interesting for M. Truvelot to institute comparison with other observers in order to settle this color question.

THE United States vessels which have so long laid at anchor at Mare Island have been sold and will be broken up. They are the steamer *Alaska*, monitor *Monadnock*, and steamers *Nyack*, *Saco* and *Tuscarora*. They brought $76,480.

Chromium.

Sources.

Until the past few years the source of all the chromium produced in this country was the chrome iron ore found quite abundantly in the Green Spring Valley, in Maryland. The important mines of this region are at Bare Hills, Soldiers' Delight, and Owing's Mills, in Baltimore County. Cecil and Harford counties have also furnished chrome iron ore, principally in the small crystalline form called sand ore. Lump ore is also obtained. The mines at Owing's Mills alone have yielded, in all, probably 5,000 tons. But this entire source has been practically abandoned, not from exhaustion of the mines, but because richer ore can be obtained from regions to be mentioned. As the cost of grinding and decomposing the ore is the same for rich and poor grades, the rich ores are naturally preferred. Moreover, the higher the percentage of chromium in the ore the easier is its decomposition and the less is the waste involved. An objectionable feature of the sand ore is that it contains silica in considerable quantity, and this forms silicate of potassium with the potash used, thus causing loss of alkali.

Quite recently a new deposit of chrome ore has been discovered in Jackson County, North Carolina. It promises to be of better quality than any other in the Eastern States.

Russia and Turkey have also supplied ore to the American market, and continue to do so in small amounts. But practically all the chrome ore used in this country at present comes from California, particularly from the neighborhood of San Luis Obispo.

The following information regarding the occurrence and mining of chromic iron ore in California is furnished by Mr. C. G. Yale: "This is a plentiful ore in many parts of the state. The only deposits from which much ore has as yet been extracted are located in San Luis Obispo, Napa, Sonoma, Del Nortc, and Placer counties. From some of these counties the shipments were several years ago considerable. Latterly, however, the business, proving unprofitable, has dwindled to small proportions. The chromic iron found in this state is of good quality, carrying from 40 to 60 per cent of the oxide, and commanding full prices in Baltimore, where the most of it was sent, some having been sent also to England. The mines near San Luis Obispo, five miles from the town, on the line of the San Luis Obispo and Santa Maria railroad, are the most prominent. Some three years since, chrome iron was found about seven miles east of Iowa Hill, Placer County. The ore, which is of good quality, is found in irregular masses, disconnected and imbedded in the country rock, and varying in weight from a few pounds to several hundred tons. Since this discovery the mining and shipping of chrome ore from Placer County is becoming an important industry. Shipments are made from Auburn regularly, the ore coming from points on the Forest Hill and Georgetown divides; a great deal also is being shipped from Colfax, being brought over from what is known as Brimstone Plains, a few miles above Iowa Hill. Smiley Bros. are the principal shippers from the latter point. Chrome deposits not yet opened are known to exist in other places in the country"

Character of Ores.

The character of chrome ore is practically the same whatever the source, although it varies in the amount of chromium oxide contained between 40 and 50 per cent. Its composition may be expressed by the formula Cr_2O_3FeO; but part of the chromium may be replaced by iron, or the iron may be partly replaced by magnesium. Aluminum is also sometimes present, and silica often accompanies the sand ore as an impurity.

Amount Mined.

About 2,500 net tons were obtained from California during 1882. The price paid in Baltimore is $40 per ton, with slight variations, according to percentage of chromium oxide.

Utilization.

All the chrome iron ore used in the United States at present is made into potassium bichromate, by Messrs. Jesse Tyson & Sons, Baltimore, with the exception of a very small quantity of sand ore, which is used in making chrome steel at the Brooklyn Chrome Steel Works. The amount so used does not exceed 1 per cent of the chrome ore mined. Bichromate of potassium is, then, the one salt of chromium from which all the others are obtained. The wholesale price of bichromate in 1882 was 15½ cents per pound. By far the greatest proportion of this salt is used in calico printing, the bichromate being dissolved in water, and then deposited on the cloth in the desired color by suitable reagents. It is also made into the pigments chrome yellow and chrome green. A small quantity is used in electric batteries. Besides the bichromate made in Baltimore, about 35 per cent of the whole amount used is imported from Scotland, under a duty of 3½ cents per pound. In 1882 the amount imported was 1,972,221 pounds. Formerly American chrome ore was exported to England, but latterly the English supply has come from Russia.

No chrome ore in any quantity has thus far been worked up outside of Baltimore; but about two years ago Messrs. Harrison Bros., of Philadelphia, established a branch of their color works, called the Kalion Works, where they have undertaken the decomposition of chrome ore; and it is believed they are still continuing the work.

Baltimore has for a long time enjoyed a monopoly in the manufacture of bichromate; not, however, without many efforts on the part of manufactures in other cities to obtain a footing in the trade. In the past eleven years no less than fifteen attempts have been made to establish works for decomposing chrome ore in other cities, particularly in Philadelphia, New York and Boston. Not only thousands but tens and even hundreds of thousands of dollars have been thrown away in these attempts to accomplish what is put down in the text books as a comparatively simple operation. Factories have been built, and arrangements made for grinding and decomposing the ore, but in very few cases has the experiment lasted long enough to result in the production of a single pound of bichromate. It is an extremely difficult matter to carry on this manufacture so well as to produce bichromate at 15½ cents per pound; but by long experience and methods of decomposition known only to themselves, Messr. Tyson & Sons have been able to maintain a successful business, and to compete with the two other manufactories in Scotland and France.—*David T. Ray in Williams' Mineral Resources.*

Speiss.

The scientific editor of our morning contemporary (the *Sentinel*) contributes half a column of learning in this morning's issue upon what he is pleased to denominate the "lead process," whatever that may be. This new light in science says "The process has proved very valuable, as is shown in the 'bonanza' developed in the Richmond slag dump," etc., leaving the inference that the Richmond Company have been using a "lead bath process" to work this speiss. Now, the Richmond Company use no "lead bath process," and have never used such a process, or thought of using such a process. The process used by the Richmond Company is the result of experiments commenced several years since by Mr. Probert, first in the laboratory and finally on a large scale at the furnaces, and long before the Richmond Company were aware that St. George Bryan had an existence upon this mundane sphere of ours. The scientist of the *Sentinel* is quite as much at fault in regard to Mr. Probert's whereabouts and contemplated movements. Mr. Probert is not en route to Washington City to measure swords, figuratively speaking, with the chivalric St. George, as the scientist of the *Sentinel* has it, but here in Eureka, attending to the business of this company, never having had and not having the remotest idea of going to Washington City. The fact is, St. George Bryan does not know enough about the process worked at the Richmond to apply for a patent for it if he wanted to. Just before leaving here he went to the Richmond works to learn something about it, and was incontinently invited to leave the premises. To the inventive genius of Mr. Probert the Richmond Company and this district owe the flue-dust arresters, the refinery, and best water-jacket furnaces now in use; and our citizens, we are sure, will not be slow in giving him due credit for any and all improvements he may make in new and improved modes of reducing ores, however much the *Sentinel* may labor for a different result—*Eureka Leader, Oct. 27th.*

Death of a Great Inventor.

Charles William Siemens, the scientist, engineer and electrician, died of rupture of the heart, in London, November 20th, aged 60. The deceased, ten days ago, received a fall, the effects of which caused his death. Charles William Siemens was born at Lenthe, Germany, on April 4, 1823. After completing his education at Gottingen, he entered the Stolberg Machine Works, and in 1843 settled in London as a civil engineer. With his brother Werner he carried on investigations in electro-magnetism, and made several important improvements in the manufacture of submarine cables, and the mode of securing their insulation. The firm of Siemens Brothers has constructed many of the most important existing submarine telegraph lines, and has the contract for the new Bennett-Mackay cable. The Siemens Brothers' regenerative gas furnace and rotary furnace are of great use in the manufacture of steel. By the Siemens process the celebrated Landore mild steel is produced, hundreds of thousands of tons of which are annually manufactured.

Among the other inventions of Dr. Siemens and his brother, with whom he was always intimately associated, are the water meter, an economical steam engine, a method of gold and silver plating, the process of anastatic printing, the double cylinder air-pump, the chronometric governor, the hydraulic brake, to prevent the recoil of artillery on ships, and many other scientific instruments. But the invention with which Dr. Siemens' name has most recently been associated is the Siemens electric light, which is extensively used in England and on the continent of Europe, especially in Paris. Dr. Siemens has held many honorary positions, and stood in the very front rank of electricians. He was made a doctor of civil law by Oxford University in 1869.

A Hybrid Oak.

The following paper, by Mrs. Mary K. Curran, on "a Hybrid Oak near Folsom" (*Quercus Kelloggii* and *Q. Wislizeni*), was read at a recent meeting of the California Academy of Sciences.

The oak which is here described has been under observation for the greater part of this year. The first tree observed was at New York Ravine, a few miles above Folsom. At the first glance I thought it to be *Q. Kelloggii*—the color and texture of the leaves being very similar, and it did not at once occur to me that at that time of the year—early in March—*Q. Kelloggii* had no business to have any leaves at all, for it is our earliest deciduous oak. But soon recognizing the fact that it was an evergreen with which I had to deal, I took notice of its peculiarities, and its location, for further observation. At different times during the year other trees have been noticed, probably fifty or more, but never in groves. They are found singly in somewhat shaded localities and in the line where *Q. Kelloggii* and *Q. Wislizeni* meet. The general aspect of the tree, as before stated, is that of *Q. Kelloggii*. Its light-green color makes it appear strikingly different when it happens to be found near a clump of the dense dark-green *Q. Wislizeni*.

The tree is of middle size. The largest observed was about eighteen inches in diameter, and thirty or forty feet in height. The leaves are from 3 to 6 inches in length by 2 to 5 in breadth, narrowed below into a petiole from 4 to 10 lines in length. Leaves and petioles pubescent at first, but soon glabrous, usually lobe-dentate; cup hemispherical; acorn, three-fourths to one inch wide by one and one-half long; pubescent more nearly, as well as the cup of the type of *Q. Kelloggii*. The leaves are subpersistent, remaining a little more than a year, but clothing the branches scantily. Unfortunately other duties prevented their being observed at the time of flowering.

The tree which was first noticed did not fruit this year, but on a recent expedition I found others fruiting abundantly near Newcastle, Placer County.

Hybridity among the oaks is very difficult of determination, on account of their extreme variability. Several other probable ones have been noticed during the year, but sufficient material has not been collected. The one just described will be probably easier of identification than any other, as its parent oaks differ so greatly in the persistence of their leaves.

Bonding Mining Properties.

Among many owners of properties there exists a certain antipathy to bonding the claims. As against a certain class this antipathy is well founded. In every camp are men who seek to obtain the control of properties, by bond or otherwise, who have no money themselves, neither can they command any. This class should be left severely alone.

On the other hand, we have men who desire to purchase property for themselves or to find a purchaser, and who under favorable circumstances will consummate what they undertake. These men, when they undertake an enterprise of this kind, wish to be in a position whereby if they accomplish any thing that they may have the benefit of their efforts. Such men should be encouraged. Owners should deal liberally with them. They will find it to their interest to do so. A reasonable length of time should be given them in which to take the property themselves to be a purchaser. No exorbitant "bonus," as it is termed, or even none at all, should he demanded. Most owners of mining property expect to realize on the sale of a property, not from its production, many of them being too poor to place it on a productive basis.

When the right kind of a man is found, who is willing to spend his time and money in consummating a sale, that should be considered a sufficient bonus for him to risk, while the owner should regard the chances of a sale sufficient consideration for giving such a man control of the property.

It is to the interest of all to enlist in any mining camp the aid of outside capital. It is the only way whereby a large number of properties can be placed upon a paying basis, thus giving that prosperity which can only be secured by a large production of ore. So long as men will stand in their own light by not placing themselves in the proper position to consummate a sale to capitalists, just so long will they fail to realize any thing from their properties; just so long will we have a large number of unproductive properties which a little outside aid would make productive. We do not wish to be understood as advising a reckless bonding of claims to any man that presents himself, but if the right man does do not hesitate to give him a chance, thereby adding to your own chances of wealth as well as to the prosperity of the camp. —*San Miguel Journal.*

A NEW DEVICE invented by Edward Burke, Bernard, Iowa, for converting reciprocating into rotary motion, and vice versa, consists of the combination of two or more shafts provided with pulleys, of a link or other belt connecting said pulleys, and a pitman connection to said belt, the construction being such that the end of the pitman will continuously travel with the belt in its movement around the pulley, and communicate its power thereto.

THE ENGINEER.

Ship Structure.

For the second time, the prevailing style of ship structure is threatened seriously with mechanical revolution. The Winans system of double cigar-shape has never grown beyond experiment, save in the building of torpedo boats, and in some instances of light pontoons. The new model steamer *Meteor*, now building at Boston, has, however, novelties in construction that will demand considerable attention from the seafaring world. A description says: "The oval deck, with other peculiarities of construction, will render it almost impossible to sink her in any weather. It is asserted, if launched upside down she would right herself in the water. Her shape somewhat resembles a spinning-top cut in two, and her speed is calculated at twenty-five miles an hour. Many captains of ocean steamers say she is the only proper model for the Atlantic, and larger vessels constructed on her lines would take but five days to make the distance between New York and Liverpool."

FAST FERRY BOATS.—The crowded state of the harbors and roadsteads in nearly every portion of the globe is bringing to the attention of the ship builders the fact that handiness is becoming a prime requisite in vessels of all kinds. When a ferry-boat or a steamer, be she large or small, can maintain her normal speed and get out of the way of other vessels, instead of having to stop and wait, a very material increase in the net speed results, and this handiness consequently increases the paying capacity of a given plant. It is vastly easier to avoid obstacles—other vessels and the obstructions to water traffic—by turning at full speed than it is by stopping. Large Atlantic vessels, even with hand-steering gear, can turn at right angles to their course in a shorter distance than they can stop. With steam-steering gear or with twin propellers this power of turning becomes vastly valuable. When fifteen days were required for crossing the Atlantic the waste of two or three hours in docking a vessel was not felt; but now, when the voyage occupies but little more than seven days, it is a matter of some importance to get the ship into her berth as soon as possible after she reaches the harbor, and here handiness becomes a very paying quality.

THE CHANNEL TUNNEL.—English conservatism still holds out against the channel tunnel project. The only safety for England, according to her military guardians, is in maintaining her insular condition and stubbornly refusing to be brought into any closer relation with the rest of mankind. This theory seems to make war upon the very spirit and essence of civilization, and must surely go down under the assaults of an enlightened public opinion. But if the tunnel must not be permitted, how will it be with the railroad bridge which the French Government now proposes to build, or cause to be built, across the Straits of Dover, from Cape Grinez to Folkstone? As soundings for piers have already been authorized, it would appear that serious business is intended; but a bridge is certainly no less objectionable than a tunnel, if the purpose be to keep everybody out of the island, and proclaim a perpetual state of siege.

NAVAL ARCHITECTURE is now making steamships as symmetrically beautiful as were the sailing craft in the vaunted days of Nelson. Not only are the latest English cruisers models of destructive ingenuity and ponderable force, but they are built with due regard to the apothegm that "a thing of beauty is a joy forever." They are made of steel sheathed in wood, and in external appearance resemble somewhat the smart frigates of the days of Collingwood. These new vessels are veritable cruisers, made for sailing as well as fighting, and having canvas and screw will make fast time through the water. So perfect is the architectural work that the latest addition to the navy, the Calypso, a comparatively small vessel of not more than 2,000 tons displacement, will take nearly as large a crew as some of the iron-clads three or four times her size, and carries from twelve to sixteen breech-loading cannon.

THE PANAMA CANAL.—The great work of constructing the Panama canal is being pushed with much energy. More than ten thousand men, thirty steam excavators, forty locomotives and eight hundred tip cars are employed, and the force will soon be augmented to 15,000 men. The total length of the canal is 46 miles. Meantime Captain Eads is actually at work on his ship railway across the isthmus, much further to the north, and it begins to be a question which will first afford a highway for shipping between the Atlantic and Pacific oceans, and thus furnish a competitor to the transcontinental railways.

TWO THOUSAND Chinamen are said to be at work between Helena and Missoula, improving the road-bed of the Northern Pacific.

USEFUL INFORMATION.

Boring Deep Wells by Water Pressure.

A new and great advance has been made in sinking deep-well pipes, say from 100 to 300 feet or more in depth, in soil that will resist the sinking of the driven well-pipe.

The hydraulic pressure system has been successfully applied at Adams, Mass., where six artesian wells are now flowing; one of 187 feet in depth, which was sunk in two hours; five wells of from 100 to 150 feet in depth, one of which has a 10-inch pipe, from which flows 400 gallons per minute, under a head of 13 feet above the surface of the ground.

The method of sinking these wells is by the boring power of water under pressure, the pressure being obtained by a steam pump; or in places where a steam pump is not available a hand force-pump answers the purpose. A peculiar feature was developed in the experiments made in perfecting this system, and the stern fact brought to light that a stream of water forced into the top of the pipe would keep an opening around the outside of the pipe for a depth of 40 or 50 feet, and would reopen the passage after stopping to put on an additional length of pipe; but after getting down to greater depths the stopping of the flow would allow the sand, gravel and stones to settle down and wedge the pipe so tight that no available pressure could start it again. In the avoiding of this difficulty consists the novelty of this system. The placing in the line of pipe at every two or three lengths of a three-way cock, with the use of two lines of hose, gives a perfect control and steadiness of the flow down the pipe during the whole operation. The hose is then attached to the side outlet of the three-way cock, with the plug across the upper outlet, and the section of pipe is sunk until the attached hose reaches the ground, when another section is added and another hose is attached to the next three-way cock, as before, and the pressure of water put on, when the lower cock is turned so as to shut off the lower hose and continue the stream from the upper hose. In this way a depth of 200 or 300 feet may be attained without difficulty, possibly a much greater depth. A curious property of the power of water in keeping an open passage in an ascending current has been observed in these experiments. A plumb-bob upon a line was dropped to a depth of 50 feet upon the outside of one of these pipes while in the process of sinking, and again hauled to the surface, showing that the current maintains a clear space around the outside of the pipe, probably for its whole depth; for in addition to this, the pipe is so loose in the hole that it can be turned around by the hand, and feeds itself down. The inventor of this system is Jarvis B. Edson, of North Adams, Mass.—*Scientific American.*

EXPERIMENTS WITH BREAD.—Dr. Von Meyer and Prof. Kolbe have of late been making experiments with bread. They took salicylous acid and mixed it with the dough. In one case they saturated the dough with it. In another experiment they proceeded in the same manner, but added acid sulphate of potash to the salicylous acid, the experiments being made for the purpose of noting the preservative and other qualities in each case. After baking, the bread was thoroughly dried in the open air. Then the loaves were washed in salicylic water and placed in closed wooden bread chests. At the end of twenty-seven days after this operation the bread in both cases was free from mold, and inside the crust it was moist, and tasted nicely. At the end of forty-four days the bread which had been treated with salicylous acid alone was covered with mold, which reached deep into the interior of the loaves. In the bread which had been treated with the salicylous acid and potash, there was only a little mold, and that where the loaves chanced to touch the other bread. In its interior this bread was entirely devoid of mold, though, naturally, somewhat more dry than at the end of the twenty-seventh day. Later similar experiments made by these gentlemen led to similar results. Basing one's opinion on the above alleged results, one can safely conclude that bread thus treated with salicylous acid and potash will, in the heat of summer, keep free from mold and spoiling for from six to eight weeks, and quite likely longer. *Mueller Zeitung.*

OIL FOR WAGON WHEELS.—A practical man says: "I have a wagon, of which, six years ago, the fellies shrank so that the tires became loose. I gave it a good coat of hot oil, and every year since it has had a coat of oil or paint, sometimes both. The tires are tight yet, and they have not been set for eight or nine years. Many farmers think that as soon as wagon fellies begin to shrink they must go at once to a blacksmith shop and get the tire set. Instead of doing that—which is often a damage to the wheels, causing them to dish—if they will get some linseed oil and heat it boiling hot and give the fellies all the oil they can take, it will fill them up to their usual size, and tighten and keep them from shrinking, and also keep out the water. If you don't wish to go to the trouble of mixing paint, you can heat the oil and tie a rag to a stick, and swab them over as long as they will take oil. A brush is more convenient to use, but a swab will answer if you do not wish to buy a brush. It is quite a saving of time and money to look after the woodwork of farm machinery. Alternate wetting and drying injures and causes the best wood soon to decay and loses its strength unless kept well painted. It pays to keep a little oil on hand to oil fork handles, rakes, neck-yokes, whiffletrees, and any of the small tools on the farm that are more or less exposed."

PAPER PULP FROM CEDAR BARK.—A new use of cedar bark has been undertaken at New Bedford, Massachusetts. According to the *Northwestern Lumberman*, the Acushnet paper-mill, at that point, is nearing completion, and was built for the express purpose of manufacturing pulp and paper of cedar bark. It is the first enterprise of the kind ever undertaken, though the process has been satisfactorily tested on a small scale. An agent of the company is now in Maine purchasing a supply of bark. There is a large quantity at Bangor, Calais, and St. John, N. B., where large quantities of cedar shingles are sawed. The bark is taken from shingle butts that are 16 inches long, and are bundled for shipment like laths. The Acushnet mill will work up three cords of bark a day. The first product will be used for carpet linings, but the paper is said to be equally adapted to other important uses. For carpet linings it will be unequaled, on account of its quality of keeping off insects. Eastern ingenuity is bound to devise an endless variety for the utilization of woods, this invention for making paper of cedar bark being the latest evidence of it.

VEGETABLE WOOL.—The *Moniteur des Fils et Tissus* calls attention to a description of a vegetable wool called *Kapoc*. It comes from Java, and a specimen is on view at the Amsterdam Exhibition. It arrives at Amsterdam in its leathery covering, being itself enveloped in the seeds. It is then freed from both, and is carded so as to make a very light mattress wool, worth about 8½*d.* per pound. One of the houses engaged in this operation had made trials in spinning and dyeing this material, but the filaments are said to be like strings, and their industrial application, consequently, a matter of uncertainty.

COTTONWOOD lumber is said to be admirably adapted for the manufacture of cases for packing dry goods. Millions of feet of this species of tree are converted into boxes every year in Ohio. As it readily imbibes moisture, and therefore swells, it is not well suited to house-building purposes.

GOOD HEALTH.

A Dangerous Remedy.

It has been discovered that the extract of the yellow jessamine of the South is an effective remedy for poison oak. The extract is employed as a wash by mixing a half drachm of carbolic acid, two drachms of the fluid extract of gelsemium, one-half once of glycerine and four ounces of water.—*Southern Trade Gazette.*

And while you are putting forth such a remedy why don't you also say that yellow jessamine, or gelsemium, as the alcoholic extract of yellow jessamine root bark is known, is one of the most deadly poisons known. It is also one of the most deceitful remedies, as its first effect is to allay all excitement, while it marches on to insensibility, unconsciousness, and certain death. Dipping the hand in the extract (if strong) and then sucking the fingers has caused death. A few drops, if taken internally, will cause death with some temperaments, and a very small dose, comparatively, will cause the strongest man to succumb. No certain remedy or antidote is positively known. Negroes in the South have told us that plentiful doses of fine salt, swallowed at once, and to keep the persons poisoned on their feet and moving, would counteract its effects. An emetic is of no use; the poison enters into the circulation at once. The medical men know of no certain antidote. Gelsemium has been used, and a number of chemical reagents used with no positive success. What cures in one case has no permanent effect in another. A physician recently lost his life in New Haven, Conn., by an overdose. If you turn snakes loose tell your readers they are rattlesnakes, or else acknowledge your ignorance, but we warn our readers that gelsemium is poison of the most subtile kind, and sure as death.—*Cotton, Wool and Iron.*

HOT WATER FOR INFLAMED MUCOUS SURFACES.—Dr. George R. Shepherd, Hartford, Conn., says in the *Medical Record*: I have used hot water as a gargle for the past six or eight years, having been led to do so from seeing its beneficial effects in gynecology. In acute pharyngitis and tonsillitis, if properly used at the commencement of the attack, it constitutes one of our most effective remedies, being frequently promptly curative. If used later in the disease or in chronic cases, it is always beneficial, though perhaps not so immediately curative. To be of service it should be used in considerable quantity (a half a pint or pint) at a time, and just as hot as the throat will tolerate. I have seen many cases of acute disease thus aborted, and can commend the method with great confidence. I believe it may be taken as an established fact that in the treatment of inflammations generally, and those of the mucous membranes in particular, moist heat is of service, and in most cases hot water is preferable to steam. All are familiar with its use in ophthalmia and conjunctivitis, as also in inflammation of the external and middle ear, and I feel confident that those who employ it for that most annoying of all slight troubles to prescribe for, viz., a cold in the head or acute coryza, will seldom think of using the irritating drugs mentioned in the books, nor of inducing complete anæsthesia with chloroform in preference to the hot water douche.

SUGAR AS AN ARTICLE OF DIET.—Dutrone calls sugar the "most perfect alimentary substance in nature." Dr. Rush says: "Sugar affords the greatest quantity of nourishment in a given quantity of matter of any substance in nature." Sir John Pringle tells us that the plague has never been known to visit any country where sugar composes a material part of the diet of the inhabitants. Dr. Cullen is of the opinion that the frequency of malignant fevers of all kinds has been lessened by the use of sugar. The celebrated Trouchina recommended sweetened water for almost every malady. Dr. Frothergill was very anxious that the price of sugar should be so far reduced as to make it accessible to the common people. Dr. Franklin had taken large quantities of blackberry jam for relief from pain of the stone, but discovered at length that the sanitary property resided wholly in the sugar. Sugar has been found to be an antidote to the poison of verdigris, if taken speedily and in abundance. It has been said that sugar injures the teeth, but this does not deserve a serious reflection. The plentiful use of sugar is one of the best preventatives of the diseases produced by worms. Nature seems to have implanted love for this aliment in children, as if it were on purpose to defend them from those diseases.

THE PULSE OF ANIMALS.—The health of animals, as well as that of human beings, may often be guessed at very shrewdly by simply feeling their pulse. In a horse a good and strong but quiet pulse beats forty times a minute, in an ox fifty to fifty-five, in sheep and pigs not less than seventy nor more than eighty for ordinary health. It may be felt wherever a large artery crosses a bone. In the horse it is generally felt on the cord which crosses over the bone of the lower jaw in front of its curved position, or in the bony ridge above the eye; and in cattle over the middle of the first rib. In sheep it is, perhaps, easiest to place the hand on the left side, where the beating of the heart may be felt. A rapid, hard, and full pulse in stock points to inflammation and high fever; a rapid, small, and weak pulse also to fever, but to fever accompanied by a poor and weak state of the subject. A very slow pulse in stock will often be found to indicate brain disease, while a jumping and irregular pulse shows something wrong with the heart.—*London Graphic.*

EFFECTS OF ELECTRICITY UPON THE NERVES AND HEART.—Among the curious exhibits at the late Munich Electrical Exhibition were a series of photographs representing the various changes and contortions produced in the human face by subjecting the different facial nerves of a patient to the action of electricity. The expressions of joy, pain, surprise, doubt, disgust, etc., were easily realized, according to the nerve that was touched by the electrode. Other observations and experiments were made by Prof. Von Zeimssen which promise to be of great importance. A comparison was instituted between the continuous and induced current in the stimulation of the important accelerator and depressor nerves which control the heart. The professor found that an induced current, so far from stimulating the nerves of the heart, as heretofore believed, is perfectly inoperative, whereas a continuous current from an ordinary battery is of the very greatest activity.

SIGNS OF SHORT AND LONG LIFE.—Lord Bacon's signs of short life are quick growth; fair, soft skin; soft, fine hair; early corpulence; large head, short neck; small mouth, fat ear, brittle, separated teeth. Some of his signs of long life are slow growth, hard, coarse hair, rough, freckled skin; deep furrows in the forehead, firm flesh, with veins lying high; wide nostrils; large mouth; hard, gristly ear; strong, contiguous teeth. He adds that early gray hair is not significant, some of the longest livers having turned gray in early life.

CURE FOR SMALLPOX.—In an old copy of the *Boston Journal* we find the following: "I am willing to risk my reputation as a public man," wrote Edward Hine to the Liverpool *Mercury*, "if the worst case of smallpox can not be cured in three days, simply by the use of cream of tartar. One ounce of cream of tartar dissolved in a pint of water, drank at intervals, when cold, is a never-failing remedy. It has cured thousands, never leaves a mark, never causes blindness, and avoids tedious lingering."

A SINGLE Eastern railroad recently discharged twenty-seven employees for color-blindness.

IT is said that dwarfs die of premature old age, and giants of exhaustion.

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Passing Events.

The notable event of the week in mining circles has been the decision in the Northern Belle and Holmes mining companies suit, in which the latter was awarded large damages. We refer to the matter more fully elsewhere.

All good American citizens, being so instructed by their President and Governors, kept one day this week as a holiday, most of them celebrating the occasion by a Thanksgiving dinner, this form of celebrating being now properly recognized.

The shipment this week to the Comstock of a heavy pumping outfit is an event worthy of more than passing notice, and we give a description of the machinery in another column.

BEAR VALLEY.—"The lake to be made in Bear Valley, by a dam across the Bear Canyon, is near completion. The lake will cover nearly 1,000 acres of land, and furnish summer irrigation for a large amount of land in San Bernardino, besides water power for manufacturing purposes and good duck hunting in the winter. It will be a grand and profitable enterprise, and we hope will induce the making of many more similar ponds."—Los Angeles *Herald*.

Bear Valley is situated in the mountains of San Bernardino County, and is principally owned by parties interested in the settlement of the Redlands.

Foundry Notes.

The Hydraulic Pumps for the Chollar, Norcross and Savage Mining Companies.

On Saturday last the large hydraulic pump for the above mining companies was set in operation at the Risdon Iron Works of this city, and was kept running until noon of the following Monday, to enable those interested to inspect the massive machinery in motion.

The trial was most satisfactory, and immediately it was over a large force of mechanics was set to work to take the machinery apart for the purpose of shipping it to its destination, where it will be set in final operation just as soon as it is possible to get it in position.

The new pump is of the same capacity as that built in 1881 for the above companies, and is an extension to the present system. The first pump was placed at the 2,400-foot level of the Chollar mine, and is now raising 2,000 gallons of water per minute through a vertical height of 800 feet, and discharging the same into the Sutro tunnel, which enters the mine at the 1,600-foot level. The new pump will be placed 230 feet below the present one, and will raise 2,000 gallons of water per minute from the 2,630-foot level to the Sutro tunnel in a single lift of 1,030 feet.

The motive power will be water supplied from the Virginia and Gold Hill Water Works, although the pumps are so constructed that in case of failure of water supply they can be run equally well by a surface steam-engine and accumulator, which renders them independent of either in case of accident to one.

The Pump

In itself consists of two hollow brass plungers 13⅝ inches in diameter, lying horizontally opposite each other, and connected by a cross-head sliding on the main bedplate. These are the pump plungers, and on either side of them are two brass power rams 7½ inches in diameter, also connected to the above cross-head. By admitting water to these power rams, the motion which takes place is transmitted by means of the cross-head to the pump plungers, which admit the water into the pump on one stroke and force it up the shaft on the return stroke. Many improvements have been applied to the new pumps, the most important of which is the

Valve Motion

Recently invented by Mr. Joseph Moore. By means of this motion the pressure and exhaust valves will be under perfect control, and the action of one valve will be dependent upon the motion of the other. The pipes which supply water to these pumps are four miles long, and it can therefore be readily understood why all sudden closings of the valves must be avoided. The pressure pipes in the shaft are of cast iron, 8 inches inside diameter and 2 inches thick. The return pipes are also of cast iron, 10 inches in diameter, while the two discharge columns are of wrought iron, 14 inches in diameter and 5-16 inch thick. Each of the above pipes are fitted with cast-iron air-chambers 18 inches in diameter and 25 feet high, for the purpose of taking up the momentum of the water while being brought to rest by the closing of the pump valves.

The thickness of the metal in these chambers varies from 4″ on the pressure pipes to 3″ on the return pipes.

The Pipe Joints

Are made male and female, with gaskets of copper and lead. The pipes are also fitted with flexible joints—a new and simple arrangement which allows for the movement of the pipes in the shaft, and one that is much superior to the usual slipjoint and gooseneck. The working pressure of the pumps will be 3030 feet head of water, and each casting has been tested to 4,000 pounds per square inch. The heaviest thickness of cast iron used in any part is 4″, although in many places, and in every instance where tin pipes or nozzles run into one another, large wrought iron bolts have been shrunk in to take part of the strain, which, without them, would be too great for the castings to bear.

In connection with the foregoing station pump, the Risdon Iron Works build

A Suction or Sinking Pump

Used in the same capacity as the ordinary Cornish lift pump, over which it has many advantages. The pump proper consists of two hollow plungers, one placed over and as a continuation of the lower plunger, the lower plunger being twice the area of the upper. A valve is put at the bottom of the lower, and below that again in a valve chamber is another valve, or lower clock valve, and below this the wind hose. On each side of these plungers are placed two actuating rams proportioned in size to the work to be done, and of the same stroke as the plungers. The discharge pipe rises from the top of the upper ram chamber, and the two pressure pipes are connected, one from the pair of upper rams and one from the two lower rams. The whole arrangement takes up very little room, and is suspended between guides running from top to bottom of the shaft by rods which support the total weight of the pump and the water being raised. On the surface, across the shaft is a cross-girder which supports a hydraulic ram or lift, capable of raising the whole weight, and below this girder are two sliding pipes in stuffing boxes, which allow the pressure pipes to move, say eight or ten feet up or down, without breaking the water connection or interfering with the working of the pumps. The discharge pipe can be operated in the same way, but is usually led off to one side, and lengthened or shortened as may be required, just as in the Cornish sinking-lift. The two pressure pipes are led to a surface engine, to which is attached two plain plungers of the same area as those below. A direct-acting steam-engine is most convenient whose piston-rod is continued through each end of the cylinder, and forms the plungers above referred to.

The Mode of Action.

The mode of action is to lower the pump into the sump by means of the hydraulic ram on top; then start the surface engine, a stroke of which, say to the left, forces the water down the left-hand pressure pipes to the lower power rams of the sinking pump, thus raising them, and with them the main plunger to the top of the stroke. Upon reversing the engine on the surface the water is forced down the right-hand pipes and up the left, thus forcing the upper rams down to the bottom of the stroke, and so on, each stroke discharging equal quantities, of water to the surface; that is one-half the contents of the lower or large ram is sent to the surface, while the other half takes the place of the upper ram. On the next up stroke the lower ram draws from the sump its full capacity of water, and the upper ram displaces its capacity, which is forced to the surface. Thus on each stroke one-half of the quantity sucked up by the lower or larger ram is sent to the surface in equal quantities.

When a blast is to be fired in the sump a signal to that effect is sent to the surface. By means of a small valve water is then admitted to the hydraulic ram, and in a few moments the whole pump is lifted free from the bottom and out of the way of the shot, to be again lowered and set to work when the blasting is over. As the work progresses pipes are added and hanging links put in just in the same manner as in the Cornish sinking lift.

The Whole System

Is remarkably simple and cheap, and works with great economy, its chief advantage being that depths of 1,000 feet can be sunk with one lift as easily as with the Cornish lift of 200 feet, with additional plungers of every 200 feet thereafter, besides all the inconvenience and expense of spear-rods, balance-bobs and stations. It can also be withdrawn with equal ease should the mine become full of water, and can be run as well above as under water. The room taken up in the shaft is very little; the whole can be put in one compartment of a shaft and still leave room for a cage to travel up and down. Another advantage is that it can be operated in winzes away from the main shaft any distance. It is particularly well adapted when surface water power can be obtained to drive the two surface rams, and the water can then be applied to the station pumps or sinking lift in the manner above described.

Blasting in Mines—No. 16.

Vigorit Powder.

The principle adopted in the manufacture of vigorit powder consists in a combination of nitro-glycerine with an oxidizing agent on the one hand, and a carbon-furnishing element on the other. As we stated once before in this series of articles, there is no intention of going into the questions of relative merits of the different powders in use, but simply to give some facts concerning each kind, and directions for using it. As to the qualities of vigorit, we give from the report of Wm. R. Quinan, Superintendent of the California Vigorit Powder Company, a summing up of the characteristics of the powder, as follows:

First.—It is one of the strongest, and its strength is more uniform than any other, from the nature of the absorbents, and the thorough incorporation of the ingredients. This can be shown by successive tests in the pressure gauge. Neither does the strength vary from hygrometric changes of the atmosphere.

Second.—It is safe against spontaneous decomposition. The nitro-glycerine is made from the best materials, and is thoroughly purified before being put into the powder.

Third.—It does not leak. The nitro-glycerine is better absorbed than in most powders. It does not lose strength in this way, and there is no exuding nitro-glycerine to render its transportation and handling perilous.

Fourth.—It is not deliquescent, and can be used in wet holes as well as dry. It can be stored in damp places without spoiling. It does not undergo sudden changes of character in regard to sensitiveness leading to accidents in its use.

Fifth.—It is safe against fire, friction and the shocks and jars of use.

Sixth.—It is resilient and elastic, and can be tamped with perfect safety so as to get any desired degree of condensation in the bore-hole.

Seventh.—It loses less in strength from freezing than any other nitro-glycerine powder, because it is less dependent upon the nitro-glycerine.

Eighth.—It is more efficient than most other powders under slight confinement, because it is more susceptible to detonation by the cap.

Ninth.—When exploded there is no fine dust or poisonous matter scattered through the atmosphere to be inhaled into the miner's lungs, to his discomfort or detriment.

Tenth.—The gases produced by explosion are innoxious. Most of the visible smoke is condensed aqueous vapor, which requires but a few moments to dissipate. The poisonous carbonic oxide and irritating, throat-rasping oxides of nitrogen are avoided by properly proportioning the oxygen to the other chemical elements, and by making the powder susceptible to perfect detonation by the cap.

Directions for Using Vigorit Powder.

1st. If the cartridge does not completely fill the drill-hole, cut it longitudinally, and ram it hard to the bottom with a wooden tamping-rod. If the cartridge is too large, remove the wrapper and press the powder down solidly. Ram each successive cartridge as hard as you see fit, without fear of explosion.

2d. When the primer and cap are placed in the drill-hole, press gently until you are sure they are in contact with the charge. Then tamp softly with sand or fine rock until you are sure that they are not liable to be misplaced. Afterwards tamp the remainder of the drill-hole with broken rock or fine gravel, as hard as you can without using the hammer. The more the hole is tamped the greater will be the result of the explosion.

3d. For springing a deep hole for the reception of black powder, first drop a sufficient number of cartridges, and after them the primer, with the fuse already lighted. If you wish, pour in water for tamping.

4th. If the hole is a wet one, smear the top of the primer and the fuse and cap with grease or tar or prepared gutta-percha, so as to protect it from the water.

5th. Always, if possible, use the triple-force caps.

6th. The powder will explode when frozen, but will act with diminished force. It will be better to thaw it out, either by laying in the sun or by placing in a dry tin vessel resting in a bucket of hot water; if thawed in an atmosphere of steam, the glue will be melted and the cartridge will be likely to open.

7th. Never thaw the powder by placing it upon a hot stove or before an open fire.

8th. Invariably prepare your primer at a distance from your powder, and always keep your caps and fuse outside of the mine, if practicable. Hundreds of mishaps have happened from the fuse or caps having become injured by dampness in the mine. Never store your caps in the powder magazine.

9th. In a hole completely full of water no tamping is required. Be sure that your powder is at the bottom of the hole.

If peculiarities of rock are discovered by consumers, leading to the belief that a powder of a slower or of a more rapid action will be most efficient, a description of the rock, and of the kind of powder supposed to be needed, may be sent Mr. Quinan, to the care of English, Wright & Lukens, 327 Pine street, S. F., and he will especially manufacture lots of powder for such purposes. In all such cases the applicant should be sure and state whether the holes be wet or dry.

Directions for Using Vigorit Low Powder.

STRENGTH.—This powder is the equivalent of black powder, but must be fired with a cap, or better still, with a cap and primer of high powder.

HOLES.—The holes in which it is used should be large, as in the case of black powder, or else the holes should be sprung at the bottom by a cartridge of high powder, so as to form a chamber.

CHARGING.—The powder is poured in loose and rammed down with a wooden rod, then put in the cap and primer; be sure it is down on the powder; then put in the tamping and pack it tightly in the hole.

REMARKS.—The powder is readily injured by water. The holes, therefore, should be dry. It will also gather moisture from the air if the box is left open in damp weather. Be careful to keep the lid on the box. If the powder should be injured by absorbing moisture, it can be restored by spreading it out in the sun when the weather is dry.

Collecting Flue Dust.

In order to make the description of the process quite clear, sections of the flues at different parts of its course have been given, both to show their methods of construction and the means used for obtaining both volume and surface.

Fig. 1 is the flue leading from shaft furnace No. 2 to its union with that leading from No. 3, and from the point where the flues of Nos. 2 and 3 join, to the main flue; and also the flue leading from shaft furnace No. 4 to its union with the flue leading from shaft furnace No. 3.

Fig. 2 is the flue leading from shaft furnace No. 3 to the union of the flue with that from shaft furnace No. 2.

Fig. 3 is the flue from shaft furnace No. 1 to the main flue.

Fig. 4 is the flue from shaft furnace No. 5 to the main flue.

Fig. 5 is the flue from the point of union of the shaft furnace flues to the condensing chamber at Station 16.

Fig. 6 is the flue from the six most southerly roasting furnaces to the main flue, and also the flue from the dressed-ore storehouse to the two most northerly double-roasting furnaces.

Fig. 7 is the flue from the two most northerly double-roasting furnaces to the end of the dressed ore storehouse; also the flue which runs by the most northerly roasting furnaces.

Fig. 8 is the flue of the most northerly roasting furnaces.

Fig. 9 is the flat flue of the most northerly roasting furnaces.

Fig. 10 is the first condensing chamber on the top of the first incline at Station 16.

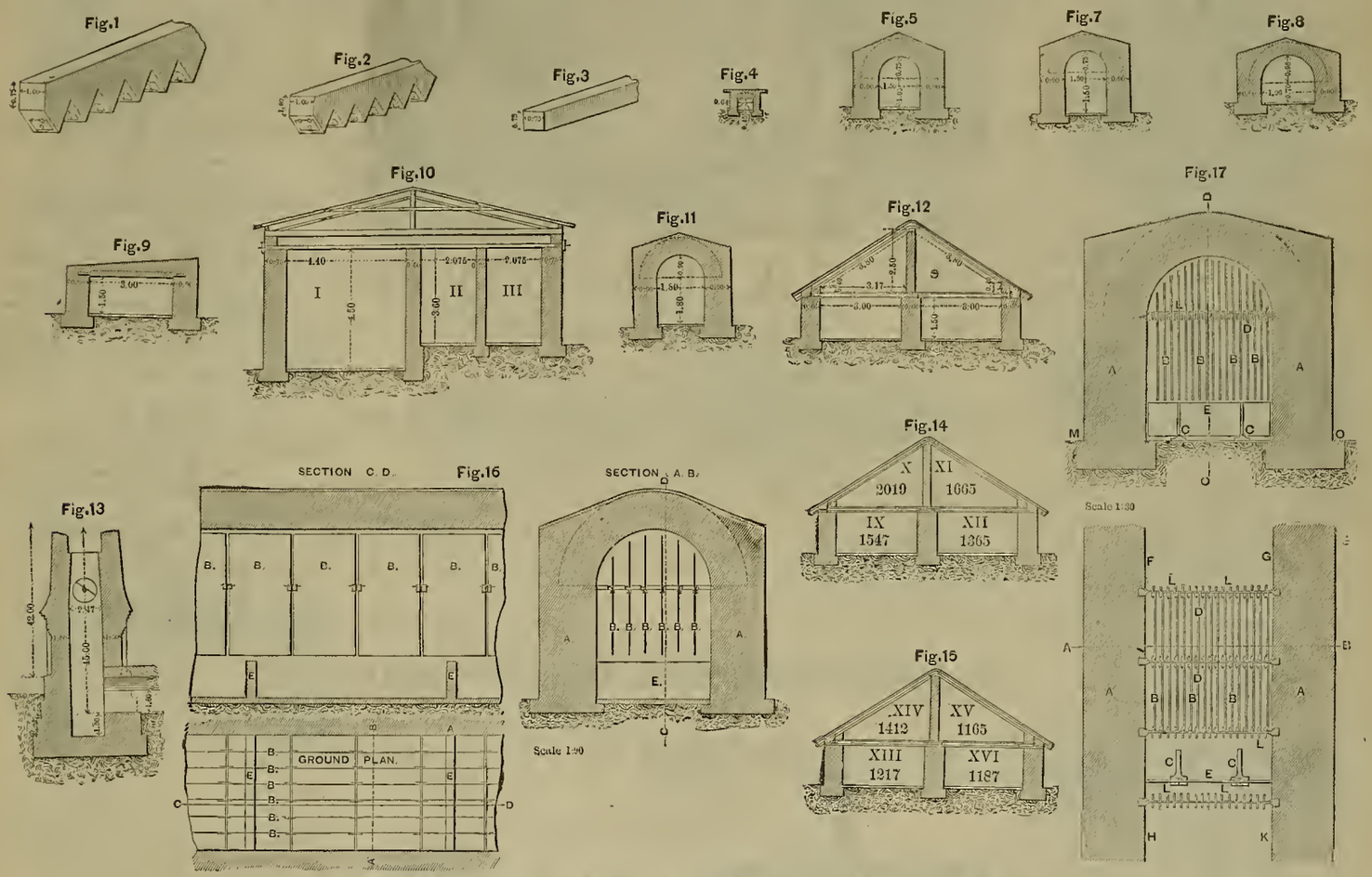
Fig. 11 is the flue from the condensing chamber to the outside of the old chimney at Station 22, and from here to the edge of the woods, and from the edge of the woods to the flues connecting with the chimney at Station 47 on the top of the hill; also the flues connecting with the chimney.

Fig. 12 is the condensing chambers X and Y beyond the chimney, but connecting with it.

The flues in the interior of the shaft-furnace building are made of sheet-iron plates 1½ millimeters thick, and are hung 30 centimeters above the throat of the furnace. Figs. 1, 2, 3, show some of the flues which lead from the cupel furnaces. The same kind of flues are used in the desilverization works, but they belong to their own system of condensation, and do not connect with the main flue. Some slight changes in these dimensions are occasionally made on account of local circumstances, but the size of the larger part of them is one square meter. The lower part of Figs. 1 and 2 have triangular projections, which have a base of two meters and are one meter high. All these pointed chambers have doors at the end of each incline, so as to make it possible to clean each pocket while the furnaces are in work. In order that the dust may not inconvenience the workmen while they are being cleaned, a sheet-iron pipe 40 centimeters in diameter is put underneath them. Into this pipe another one, which is conical at its upper end, fits loosely, so that it can be moved up and down. This is put under the triangular pocket, the cone shoved up under it, the door opened, and the dust allowed to fall down into a receptacle made for the purpose, without interfering with the workmen. Iron flues connect with these pocket flues and conduct the gases to the main flue outside the building. By this very ingenious contrivance the dust can be almost automatically removed from the flues, the cleaning of which would be more or less difficult or dangerous, without stopping the furnace, and a large amount of valuable material is taken at short intervals out of the gases before they pass into the main flue, where they would otherwise be obliged to lie until the end of the campaign.

The flues on the outside of the shaft-furnace building are of mason work. They have different sections according to the quantity of gas which they are required to carry off. These are shown in Figs. 4 to 9 and on Fig. 11. It has been found by experience that the arched flues, which at first characterized the whole of the construction, although of an excellent shape for resisting pressure from the outside, do not stand well against internal pressure, and that cracks are made in them so frequently that they are now being abandoned. The flue with rectangular section, Fig. 9, is not subject to these objections, and this style of construction is now adopted in these works and elsewhere in Europe. The roof of this flue is made of old rails covered with brickwork, and is inclined on the outside to one side, so as to shed the water. The cost of construction of this kind of flue is much less than when it is vaulted, and it has a much greater volume for the same hight and superficial area, and while it is just as likely to be acted on by the gases it is much more easily repaired. As it is much lower, the dust falling from the top falls from a less hight, and is not therefore so likely to be carried any great distance from where it fell. The cross section of the condensing chamber at Station 16 is shown at Fig. 10. The ceiling of this chamber is made out of old rails with cap bricks. Above this is a wooden roof made tight with pasteboard underneath the tiles. In every section of the flue, at convenient distances, man-holes are made for cleaning it out, and to facilitate repairs.

Up to the year 1877 the chimney shown at Station 22 was the one used for carrying off all the furnace gases. The flue used up to the year 1874 was torn down, as it was too small for the increased production of the works, and was replaced by a larger one, better arranged for taking off the dust. In 1874 a large chamber was built next to this chimney, but after some years it was abandoned on account of the large amount of repairs which were required, and the liable to heavy fines. A large amount both of volume and surface was thus lost at that point, but the surface was almost immediately regained by the system described further on. The chimney is shown at Fig. 13. It is 42 meters in hight above the socle, and its diameter is 2.47 meters in the lower part, and 1.80 meters above. As it was thought that this chimney might have a stronger draft than the proper working of the furnace would admit of, a movable damper was put in it (Fig. 13). On the outside a quadrant was placed; an arrow attached to the axis moving over the quadrant shows exactly the angle of the damper in the interior of the chimney. When every thing is working well, the angle is 45 degrees. Before the addition of the chambers, X and Y, it was as low as 27 degrees. The gas passes out of the main flue at *n*, by an elbow at Station 47, and enters the under part of the southern section of the condensing chamber building X (Fig. 12); it passes from that to the upper part of the same building, and then at *p* to the upper part of the northerly building, Y, then at *q* into the southerly part, and finally at *r* by an elbow, *r s*, enters a section of the main flue, which has been walled off just beyond the elbow *n*, and from there goes directly to the chimney.



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In the year 1877, the chimney at Station 47, and Fig. 13, was built, and connected with the flue leading to it on October 1st of that year. It was found necessary afterwards to increase the condensation surface, and on October 1st, 1880, the two buildings (X and Y, Plate I), and Fig. 12, containing condensing chambers, built beyond the chimney, were added to the flue. These buildings are 100 meters long. Each one of them consists of an upper and a lower chamber, with two divisions in each, separated by a flat ceiling which rests upon iron rails. When I visited the works in September, 1882, the whole of the upper part of the chamber (Fig. 12) had been put out of use, as the roof was leaking gas so badly as to render the works

chamber shown at Station 16 (in cut shown last week) and Fig. 10 was then built. It was thought necessary, at the time it was constructed, to make an arrangement by which it could be cleaned very frequently, whenever the works should increase their production, and to have a cut-off, shown at *b* and *k*, so that the gases might be made to pass beside it into the main flue while it was being cleaned. It was found, however, that the small quantity of dust collected made this unnecessary.

A number of experiments have been made to ascertain the temperature of the interior of the flues. It has been uniformly found that the temperature of the gases in the roof of the chambers was as shown in the table below:

At Station 15,	136° C
" " 24,	119
" " 35, at m	108
At entrance of last chambers, X, Plate I., and Fig. 12, Plate II	89
Coming out from the chambers, Y, Plate I., and Fig. 12	64

Although the sum of the sections of the two flues *ab*, *gh* is larger than that of the main flue at Station 16, they are not entirely filled with gas, and it is therefore not full, and consequently the temperature on the bottom is always some degrees lower than at the roof. The difference between these two temperatures is greater as the temperature of the gas is higher, and also as the hight of the flue is greater. At Station 15, where the shaft furnace flue joins the main one, it was found to be 8 degrees; at the entrance to the chimney at Station 47, it was found to be 2 degrees. The mean outside temperature varied during the days upon which these observations were taken, between 6 degrees and 10 degrees.

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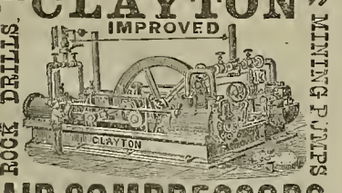
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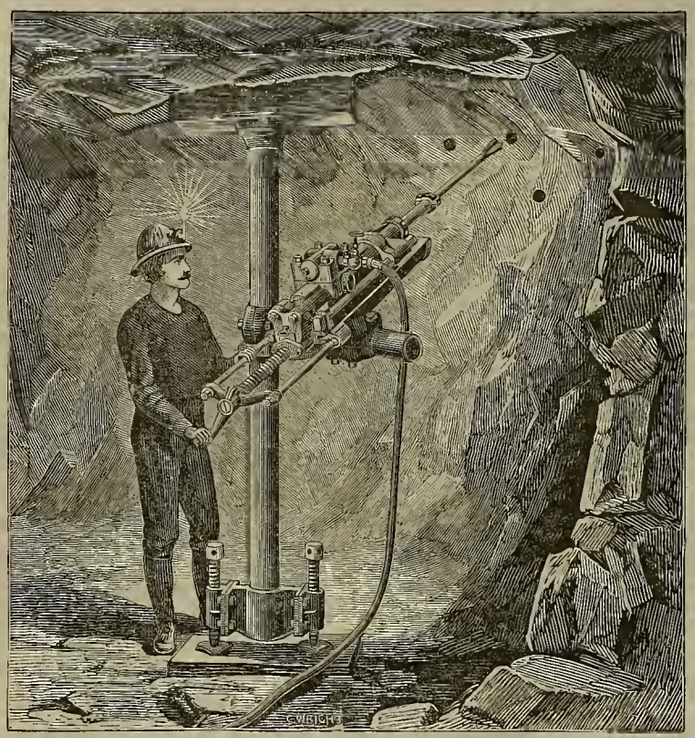
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Ingersoll, D2 3", beat National 3½"	.505 "	"
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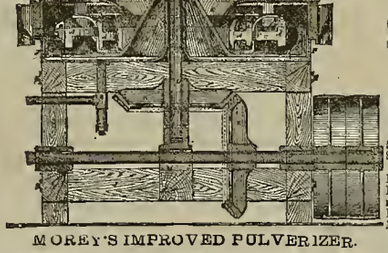
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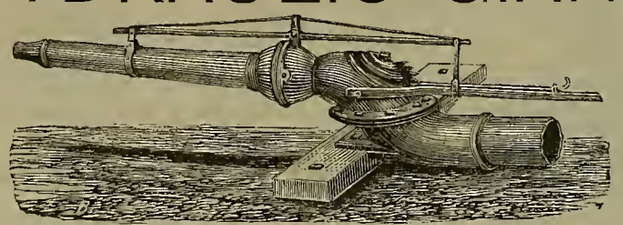
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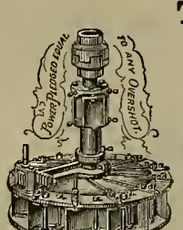
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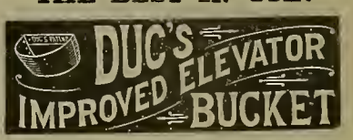
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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & CO.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F

FOR WEEK ENDING NOVEMBER 20, 1883.

288,690.—CABLE GRIP—Benj. F. Carman, S. F.

288,696.—HARNESS CHECK HOOK—A. C. Dietz, S. F.

288,707.—WAGON-REACH COUPLING—R. Jacks, Meadow Valley, Cal.

288,947.—CABLE SWITCH FOR CABLE R. R.—A. H. Lighthall, S. F.

288,948.—TAKE-UP MECHANISM FOR CABLE R. R.—A. H. Lighthall, S. F.

288,646.—ROPE RAILWAY—J. B. Low, S. F.

288,653.—SANDAL—G. F. G. Morgan, S. F.

288,724.—ATTRITION MILL—J. J. Newsom, S. F.

288,740.—CARTRIDGE LOADER—J. B. Richardson, Mountain View, Cal.

288,879.—FRICTION GRIPPING DEVICE—A. B. Smith, S. F.

10,409.—MOLD FOR CEMENT PIPE—N. W. Stowell, Los Angeles, Cal. (Re-issued.)

288,743.—PEA SHELLER—Alfred Swingle, S. F.

288,745.—ORE PULVERIZING MILL—Wm. I. Tustin, S. F.

288,901.—ELEVATED WATER TANK—N. T. Whiting, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise), at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through DEWEY & CO.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

LIFTING-JACK.—Ira Rose, Salinas, Monterey Co. No. 288,367. Dated Nov. 13, 1883. This invention relates to that class of lifting-jacks in which hy means of a vibrating lever which operates pawls in engagement with a ratchet, said lever and its standard are raised. The invention eousists in a novel arrangement of the stationary ratchet standard with the sliding standard, whereby by the operation of the lever aud pawls the two are firmly held together and the jack rendered more rigid and capable of supporting greater weight. The object of the invention is to provide a simple, effective and strong lifting jack for wagons.

TELLURIAN.—A. C. Shaw, assignor of one-half to Geo. H. Fuller, S. F. No. 288,372. Dated Nov. 13, 1883. This improvement in tellurians is mostly in the detail of construction. One peculiar feature is that in order to produce the actual effect of day aud night upon the earth's surface as it revolves, to show the phases of the moon and produce the effect of an eclipse, the sun-globe is formed to two hollow sections, which may be separated or opened to admit a light. The rays of the light falling on the earth and moon will produce the effect of night and day, solar and lunar eclipses, and will always show the phases of the moon.

GANG PLOW.—Henry S. Palmer, Santa Ana, Los Angeles Co. No. 288,362. Dated Nov. 13, 1883. The improvements eousist in details of eoustruction, and the means for leveling and regulating the depth of the plows. The present ordinary construction of levers by which the cranks or crank-axle upon which the wheels are mounted or operated renders it often a matter of some difficulty to raise the plows out of the ground or regulate their depth. It is the object of this invention to render this operation easy.

FOLLOWER FOR RAM ELEVATORS.—Wm. R. Low, S. F. No. 288,352. Dated Nov. 13, 1883. This patent covers certain improvements in that class of elevators in which the eage or ear is elevated by what is known as ram elevators provided with follower-guides for steadying the ram spindle. The improvements include more particularly certain details of construction which strengthen, brace and improve the device.

CAR COUPLING.—E. M. Hobbs, Santa Rosa, No. 287,934. Dated Nov. 6, 1883. This invention relates to certain uew and useful improvemcuts in car-coupling, and especially to one patented Nov. 21, 1882, by the same inventor. The invention consists in an improvement in the connecting and coupling-pin, and in a guard for the externally pivoted link latch.

GANG PLOW—T. L. Grigsby, Yountville, Napa Co. Cal. No. 287,536. Dated Oct. 30, 1883. This invention is applied to that class of gang plows which are specially adapted for work in vineyards, cotton fields, and in all places where rows are planted. The invention consists in its means for connecting the plows with the frame, whereby they may be adjusted, and in a center plow aud the means for connecting it.

IF YOU WANT a lubricant that will run any thing cool write CHARLES J. WOODBURY, GENERAL MANAGER LUBRICATING DEPARTMENT CONTINENTAL OIL AND TRANS. CO., for "Lubrico." It is the best compound grease in the market. Shipped in 5, 10 and 25-pound cans, half barrels and barrels. Warranted to give satisfaction. Observe the numbers: No. 2 is soft for outside work; No 3 is medium soft; No. 4 is medium hard; No. 5 is very hard, where unusual lubrication is demanded. Send for Catalogue of Lubricating Oils

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ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELIN'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Andes S M Co	Nevada	23	25	Nov 10	Dec 20	Jan 9	B Burris	309 Montgomery st
Boston Con M Co	California	5	25	Nov 21	Dec 24	Jan 14	F E Luty	330 Pine st
Bullion M Co	Nevada	23	20	Nov 16	Dec 18	Jan 7	J F Brazell	320 Montgomery st
Bodie Tunnel Co	California	3	15	Nov 1	Dec 7	Dec 27	C O Harvey	309 California st
Benton Con M Co	Nevada	11	10	Nov 1	Dec 6	Dec 24	W H Watson	302 Montgomery st
Buena Vista Petroleum Co	California	31	25	Oct 30	Dec 5	Dec 27	L Kennann	220 Sansome st
Caledonia M Co	Dakota	14	10	Oct 21	Dec 13	Jan 11	W L Oliver	328 Montgomery st
Columbus Con M Co	Nevada	1	25	Nov 5	Dec 10	Jan 3	J M Buffington	309 California st
California M Co	Nevada	9	20	Oct 1	Nov 7	Dec 5	C P Gordon	308 California st
Champion M Co	California	13	10	Oct 8	Nov 15	Dec 8	Theo Wetzel	522 Montgomery st
Elko Con M Co	Nevada	2	15	Oct 6	Nov 12	Dec 4	F Sperling	309 California st
Eureka Tunnel Co	Nevada	2	50	Nov 9	Dec 10	Jan 11	J Pardy	Eureka, Nevada
Gould and Curry S M Co	Nevada	46	50	Nov 7	Dec 12	Jan 3	A K Durbrow	309 Montgomery st
Gold Lead M Co	Nevada	4	50	Nov 9	Dec 17	Jan 8	J Bronzan	328 Montgomery st
Hale & Norcross M Co	Nevada	73	50	Nov 17	Dec 21	Jan 14	J F Lightner	309 Montgomery st
Henrietta Gravel M Co	California	7	02	Oct 23	Nov 23	Dec 14	L Gross	530 Washington st
Martin White M Co	Nevada	16	25	Sept 22	Nov 7	Dec 6	J Scoville	309 Montgomery st
McElroy Gravel M Co	California	11	25	Oct 25	Nov 30	Dec 26	J T Fogarty	606 Montgomery st
Original Keystone M Co	Nevada	7	30	Nov 21	Dec 22	Jan 10	F E Luty	330 Pine st
Savage M Co	Nevada	27	50	Nov 3	Dec 7	Dec 27	E B Holmes	309 Montgomery st
Union Con M Co	Nevada	24	50	Oct 15	Nov 20	Dec 11	J M Buffington	309 California st
Utah S M Co	Nevada	46	1.00	Oct 11	Nov 16	Dec 3	G C Pratt	309 Montgomery st
Wide Awake M Co	Arizona	17	20	Nov 17	Dec 28	Jan 28	C Hildebrandt	320 Sansome st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DAT
Black Range Con M Co	Arizona	C B Holmes	309 Montgomery st	Annual	Dec 4
Bechtel Con M Co	California	W H Lent	309 Montgomery st	Annual	Dec 10
Eintracht Gravel M Co	California	H Kunz	316 Post st	Annual	Dec 4
Hend Center & Tranquillity M Co	Arizona	J W Pew	310 Pine st	Annual	Dec 11
Mexican M Co	Nevada	C L McCoy	309 Montgomery st	Annual	Dec 4
Monumental Tunnel M Co		J H Sayre	330 Pine st	Annual	Dec 7

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Bulwer Con M Co	California	W Willis	309 Montgomery st	15	July 2
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	Nov 19
Mt Diablo M Co	Nevada	R W Heath	318 Pine st	25	Nov 26
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	Nov 12
Silver King M Co	Arizona	J Nash	315 California st	25	July 12

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Nov. 7.		WEEK ENDING Nov. 14.		WEEK ENDING Nov. 21.		WEEK ENDING Nov. 27.	
Alpha	1.75	1.90	1.15	1.60	1.05	1.35	....	1 65
Alta	1.30	1.65	1.00	1.45	1 00	1.25	1.05	1,35
Andes	.65	.70	.35	.65	.35	.40	.40	.55
Allion	....	.40	....	.40	....	.40	....	....
Argenta	....	....	....	....	....	.10	....	....
Atlas	....	....	....	....	....	....	....	....
Belcher	....	....	.85	.90	....	....	....	.80
Belding	....	....	....	....	....	....	....	....
Best & Belcher	3.60	3.85	3.00	3.60	3.00	3.25	2.65	3.55
Bullion	.65	.66	.50	.65	.45	50	.40	.65
Bechtel	....	....	....	....	....	....	....	....
Belle Isle	....	.45	.10	.45	.35	.40	....	.30
Bodie Con	.30	.40	.25	.35	.35	.50	.30	1 25
Benton	....	.15	.10	.15	.05	.10	.05	.15
Bodie Tunnel	....	.05	....	....	....	.20	....	....
Caledonia	....	....	.10	.15	....	.15	....	....
California	.25	.30	.25	.30	....	.25	....	.25
Challenge	....	....	....	.35	....	.35	....	....
Chollar	2.05	2.35	1.65	2 15	1.65	2.05	1.85	2.05
Confidence	1.50	1.70	1.30	1.50	1.30	1 50	1.10	1.60
Con. Imperial	....	.05	....	.05	....	.05	....	....
Con. Virginia	.45	.50	.35	.45	.40	.45	.35	.45
Crown Point	1.05	1 10	.80	1.05	.85	.95	.80	1.00
Day	....	....	....	.40	....	....	....	.40
Elko Con	....	....	.20	.40	....	.20	....	.20
Eureka Con	4 00	5.00	....	3.85	....	6.85	3.50	4.10
Eureka Tunnel	.05	.10	....	.05	....	....	....	....
Exchequer	.40	.45	.35	.45	.35	.40	.30	.40
Grand Prize	.45	.60	.30	.40	.25	.30	.25	.35
Gould & Curry	1.70	1.90	1.20	1.65	1.25	1.50	1.10	1 50
Hale & Norcross	1.70	2.25	1.35	1.80	1.35	1.60	1.05	1 80
Holmes	....	.20	....	....	....	....	.30	1.00
Independence	.35	.40	....	....	....	....	....	....
Julia	....	.05	....	....	....	....	....	....
Justice	.25	.30	.15	.30	....	.25	.20	.25
Jackson	....	.50	....	....	....	....	....	....
Kentuck	....	2.00	....	2.50	....	....	....	....
Martin White	....	....	....	.25	....	.25	....	....
Mono	....	....	....	....	....	.40	....	.50
Mexican	3.00	3.30	2.25	2.95	2 25	2 70	2.20	2.80
Mt Diablo	....	4.00	....	....	3.00	3.25	....	3.25
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	....	....	....	....	....	....	....	....
Northern Belle	4.00	4 25	....	4.00	3.90	5.90	....	2.00
North Noonday	....	....	....	....	....	....	....	....
Navajo	3.05	3.55	3.70	3.35	3.70	3.75	3.80	3.90
North Belle Isle	.50	.55	....	.55	....	.50	....	.50
Occidental	....	1 40	....	1.00	1.00	1.20	.70	1.20
Ophir	4 80	5	3.70	4.05	3.70	3	3.60	5.75
Overman	.25	.30	....	.20	.20	.25	....	.20
Oro	....	....	....	....	....	....	....	....
Potosi	.75	.90	.55	.75	.60	.65	.65	.75
Pinal Con	....	....	....	....	....	....	....	....
Savage	.60	.90	.50	.80	.50	.60	.30	.70
Seg. Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	3.8	4.15	3.20	3.90	3.20	3.65	2.50	3.85
Silver Hill	....	....	....	.15	....	....	....	....
Silver King	....	....	....	7.75	....	7.75	....	....
Scorpion	....	.50	.45	.50	....	.50	.40	.50
Tuscarora	....	....	....	....	....	....	....	....
Union Con	3.55	3.80	2.60	3.75	2 60	2.70	2.65	3.65
Utah	1.40	1.70	1.30	2.25	2.20	2.30	1.40	2.05
Ward	....	....	....	....	....	....	....	....
Wales	....	....	....	....	....	....	....	.25
Yellow Jacket	3.05	3.35	2.50	3.30	2.30	2.90	2 05	3.15
..	....	....	....	....	....	....	....	....

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persous so receiving copies are requested to examine its eontents, terms of subscription, and give it their owu patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $4 a year. Extra eopies mailed for 10 cents, if ordered soon enough. Persoual attention will be called to this (as well as other notices, at times), by turning a leaf.

Bullion Shipments.

Alice, Nov. 20, $14,687; Hanauer, 20, $8,200; Stormont, 20, $2,897; Vienna, 20, $3,200; Ontario, 20, $6,354; Horn Silver, 20, $36,000; Crescent, 20, $1,700; Hanauer, 21, $5,587; Ontario, 21, $8,348; Vienna, 21, $1,672; Horn Silver, 21, $30,000; Germania, 23, $27,600; Eureka, 23, $2,806; Hanauer 23, $5,325; Nevada, 23, 1,200; Vienna, 23, 2,806; Ontario, 23, $4,537; Horn Silver, 23, $12,000; Germania, 24, $2,654; Alice, 24, $16,366; Vienna, 24, $1,517; Horn Silver, 24, $12,000.

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Addresses. Business letters should be addressed and drafts made payable to DEWEY & Co.

Sales at San Francisco Stock Exchange.

WEDNESDAY A. M., Nov. 28.

100	Alpha		1.10
550	Alta		1.25
645	Bodie		70c
50	Andes		25c
200	Best & B		2.65
100	Alpha		1
100	Belmont		1.90
220	B. & Belcher	2.60@2.65	
50	Belcher		80c
570	Bodie Con	70@80c	
480	Chollar		1.75
500	Benton	05c	
2500	Con. Virginia	30@35c	
100	Belcher	80c	
150	Crown Point		70c
100	Chollar	1.80	
50	California		20c
350	Crown Point	75c	
50	Confidence		1.00
100	Exchequer	30c	
100	Challenge		25c
300	Gould & Curry	1.05	
50	Exchequer		30c
200	Grand Prize	30c	
400	Elko Con		20c
250	Hale & Nor	1.00	
1390	Gould & Curry	1@1.10	
450	Holmes	11	
50	Grand Prize		25c
200	Mexican	2.15	
220	Hale & Nor		1.05
100	Navajo	3 70@3.75	
100	Holmes		1
10	Northern Belle	2	
270	Mexican		2.10
180	Ophir	5@5¼	
100	N. Belle Is		50c
50	Occidental	75	
100	Navajo		3.75
300	Potosi	55@57½	
200	Northern Belle		2
300	Savage	30@35c	
520	Ophir	5¼@5¾	
570	Sierra Nevada	2.40	
100	Overman		15c
30	Silver King	7½	
250	Potosi		65c
160	Utah	1.60	
200	Savage		30c
670	Union Con	2.55	
100	Scorpion		40c
90	Yellow Jacket	1.85	
830	Sierra Nevada	2.30@2 4	

AFTERNOON SESSION.

100	Silver King		7.65
500	Alta	1.10@1.15	
100	Wales Con		25c
8 0	Andes	30	
550	Yellow Jacket		1.8'@2

Mining Share Market.

Dullness still prevails in the stock market. There is very little to report. The Ophir mine has bought the Morgan mill for $16,000, and it will be overhauled and repaired. A contract has been given to Senator John P. Jones for working the upper levels (all above the 1550-ft level) of the Consolidated Virginia and California mines. The contract is of the same nature as that given by the Belcher and Crown Point. Work will soon be commenced on the old works of the Con. Virginia and the California mines under this contract. At the Hale and Norcross they have been finding some very good ore to the northward on the 2700 level—ore that in former years would have caused quite a little jump in the stock. Fear of water prevents them crosscutting or going in such a direction as to cross the stratification. Therefore, until the new hydraulic pump is in operation, no good square prospectinge an be done. The big pump is completed, and it can be set up in ten days after its arrival, as the foundations are all ready for it. At Gold Hill the leading mines are extracting and sending to the mills the usual amount of ore. The Alta folks will have their 2150 level drained in a few days, and it will then be but a short time before they can resume active prospecting.

WHEN you feel life is a burden, and nothing you try seems to ease your dyspepsia, find a sure relief in Brown's Iron Bitters.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. W. A. WRIGHT—Merced and Tulare counties.
JARED C. HOAG—California.
B. W. CROWELL—Nevada.
I. M. LEHIY—San Bernardino and San Diego counties.
J. J. BARTELL—Santa Clara county.
C. E. CURTIS—Kern and Fiesno counties.
A. S. DENNIS—San Mateo county.
A. C. KNOX—Colusa, Tehama and Yolo counties.
A. J. DUDGEON—Mendocino and Humboldt counties.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing only one cent) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some responsible party requested to stop it, we shall positively demand payment for the time it is sent

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions The pavilion has new varieties of performances. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

San Francisco Metal Market.

[WHOLESALE.

THURSDAY, Nov. 30, 1883.

ANTIMONY—Per pound	14	@	15
IRON—American Pig, soft, ton	30 00	@	—
Scotch Pig, ton	26 00	@	27 50
American White Pig, ton	—	@	—
Oregon Pig, ton	—	@	—
Clipper Gap, Nos. 1 to 4	32 50	@	35 00
Refined Bar	4	@	—
Horseshoes, keg	5 50	@	—
Nail Rod	7¼	@	—
Norway, according to thickness	6¼	@	7
STEEL—English Cast, lb	16	@	25
Black Diamond, ordinary sizes	14	@	—
Drill	15	@	16
Machinery	12	@	14
COPPER—Ingot	22	@	—
Sheet	31	@	35
Sheeting, t inued, 14x18	22	@	23
Nails	17	@	—
Bolt	31	@	—
Old	8	@	—
Bar	—	@	—
Cement, 100 fine	15½	@	—
LEAD—Pig	4½	@	4
Bar	6	@	—
Pipe	7	@	—
Sheet	8	@	—
Shot, discount 10% on 500 bags: Drop, ₱ bag	2 10	@	—
Buck, ₱ bag	2 30	@	—
Chilled, do	2 50	@	—
TIN PLATES—Charcoal	7 55	@	—
Coke	5 50	@	5 75
Banca Tin	25 00	@	—
Australian	25 00	@	—
I. C. Charcoal Roofing, 14x20	6 50	@	6 80
ZINC—By the cask	19	@	—
By the cask, less the cask	90	@	—
NAILS—Assorted sizes	3 30	@	4 75
QUICKSILVER—By the flask	34½	@	—
Flasks, new	1 05	@	—
Flasks, old	85	@	—

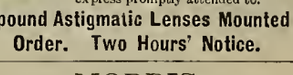
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Tulare County Notes.

Mr. Geo. T. Buckland, the inventor of the patent spring buggy, was recently burned out in Tulare, but is rebuilding his shop with a fire-proof structure. It has hitherto done a good business in his specialty, and his new shop promises to be one of the substantial improvements of the town. On his farm, one mile from town, Mr. Buckland is engaged in building a reservoir 75x80 feet and four feet deep, using broken brick and cement for concrete. This will be supplied with water for irrigating by the use of three windmills and improved pumps. He will plant a forty-acre tract in vineyard and orchard and alfalfa, which will be irrigated by the means described.

An unusual interest is now manifested in agricultural and fruit land matters in this county, betokening a lively and advancing season. The great artesian belt, reaching from the rich Mussel Slough lands on the north to some fifty miles south, a little easterly, to Deer Creek, probably ten to twelve miles in width, is beginning to be better known and more properly appreciated. This belt borders Tulare on the west, and is largely tributary to this place for supplies.

The lands about Visalia, long known to be almost exhaustless in their richness and fertility, are becoming further supplied with water, and being better cultivated, proving to be among the most prolific in the State. If plentiful rains fall within the next two months Tulare County will leap forward with great rapidity, and we think realize permanent agricultural prosperity. It is our intention soon to give specially to our readers some very interesting information of this promising section of California.

Several English gentlemen are working a coal mine about twenty miles west of Huron, with favorable prospects, we understand. An air-shaft is being bored eight inches in diameter by B. F. Mull, of Tulare. This will serve to allow the gas to pass off. The shaft will connect with a tunnel, and will be enlarged to a working shaft by digging out from below, as in stoping.

The railroad repair shops at Tulare form a veritable oasis, being in a park of trees that have been planted. The favorably known master mechanic, Seymour Johnson, came there in 1875, when there was little but the dry plains to see. He expresses a strong belief in the future of the town. These railroad shops are the most important between San Francisco and Los Angeles. They handle the motive power from Latbrop to Mohave, and the volume of business is steadily increasing. The company uses ten 12-wheel engines in hauling over the Tehachapi pass, and some of them weigh 123,000 pounds, with drivers 54 inches in diameter. Some of these engines were made by the company, under the design and superintendence of A. J. Stevens, master mechanic, and others were made in the East. In the matter of repairs it seems that the work on the eastern engines is as ten to one on the home-made ones, which speaks well for the California-made ones; all being designed by Mr. S.

Mr. D. W. Madden, who has kept the Pacific Hotel since it was established in 1875, has proved himself one of the most useful of citizens of Tulare by his liberal enterprise in constructing water works, which supply the town with a remarkably fine quality of desirable water for drinking and other domestic purposes, and also for a good bathing establishment connected with the hotel. The well is an artesian one, 7 inches in diameter and 214 feet deep. The water is elevated to tanks in a neatly constructed and high tower, which is the most sightly architectural object in the vicinity. The water is pumped by a fourteen horse-power engine. The town is served through some four miles of pipe. These water works once saved an important part of the town from conflagration, and more recently saved the whole town from what might have been a very extensive fire. A good feature to be noticed is that free drinking-water is supplied through globe faucets all over the town. These works being due to the enterprise of a single individual, form certainly a praiseworthy feature of the town.

J. C. Smith's new artesian well, which he terms the "Great Wabash," is located seven miles nearly south of Tipton, in the southeastern quarter of Section 2, Township 22. The well is an 8-inch one, 550 feet deep, and gives a 5½ inch flow above the pipe. It forms quite a little creek, and the water from it has a perfectly sweet taste, being apparently free from sulphur and other minerals. It is on government land, located by Mr. Smith's daughter, who has secured most of the cash for boring the well by teaching school in the county. The well was bored by B. F. Mull, at a cost of $1,060. This is considered the best well yet secured in the belt, and was only lately finished. It is surrounded by some of the finest and smoothest land in the vicinity.

The Tulare Library Association rooms are attractive to strangers as well as useful to the residents. The building was constructed and donated by the S. P. Railroad Company. It embraces a large hall, for entertainments, balls, etc., reading rooms for gentlemen and ladies, sitting rooms, chess rooms, etc., furnished with a library containing valuable volumes for amusement and reference, billiard tables and other conveniences for recreation. Mr. Seymour Johnson, Master Mechanic at the railroad shops, is President of the Association, and takes a commendable interest in its welfare.

We acknowledge recent fraternal courtesies received from the enterprising editors and publishers of the Tulare press, including the *Delta*, *Times* and *Journal* of Visalia, and the *Journal* and *Messenger* of Tulare City. Also special kindnesses extended by numerous friends of our paper and enterprise in Tulare and Kern counties.

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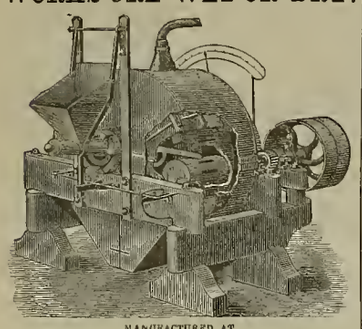
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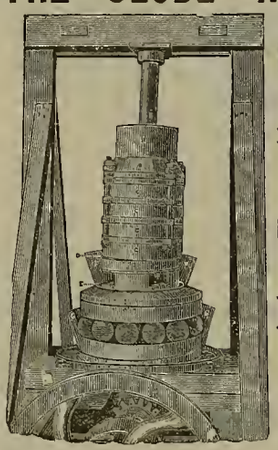
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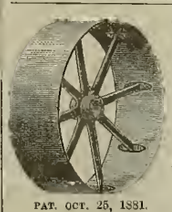
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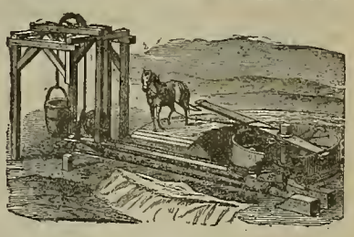
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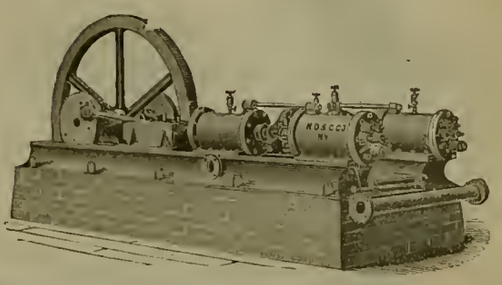
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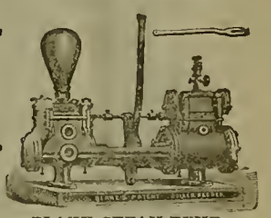


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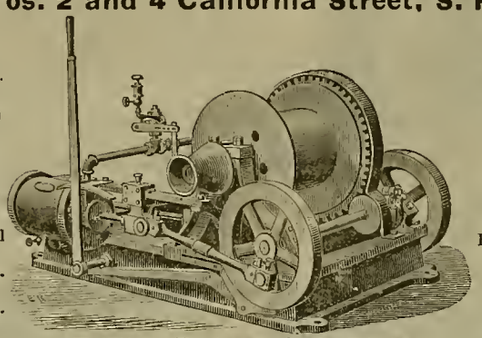


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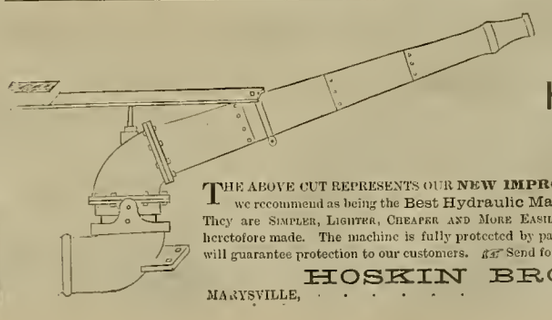
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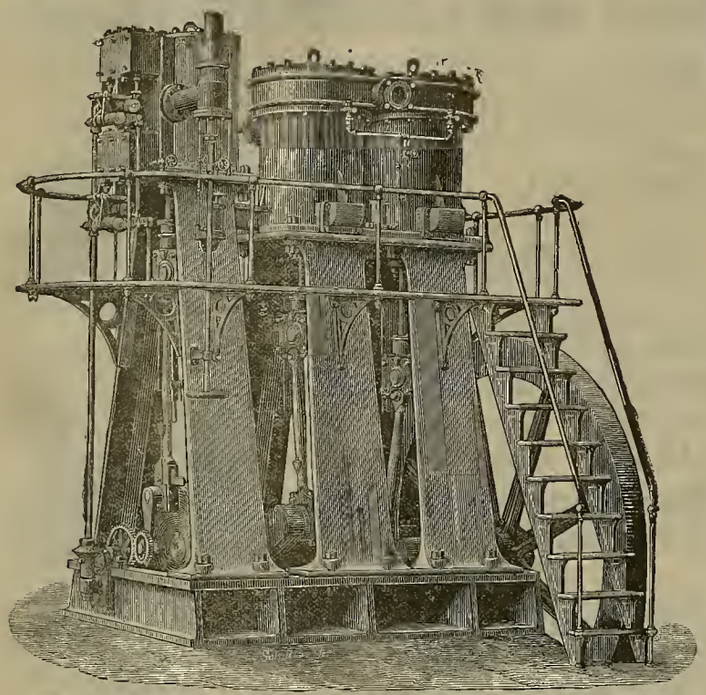
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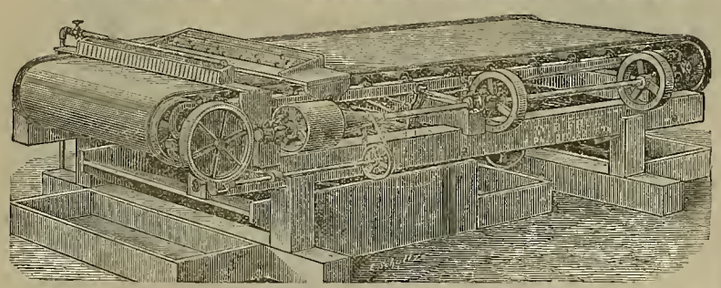
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To those intending to manufacture or purchase the so-called "Triumph" Concentrator, we herewith state:

That legal advice has been given that *all shaking motion* applied to an *endless traveling* belt used for concentration of ores is an infringement on patents held and owned by the Frue Vanning Machine Company.

That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.

That the patent laws make *users* of infringements responsible as well as makers, and the public is therefore warned that there is considerable risk in purchasing any end-shake machine until our various patents have been decided.

That if there are those who for any reason prefer an end-shake machine, we can manufacture and sell to such machine of that description, as efficient as the Triumph, and at a lower price, and no liability for infringement will then be incurred by the purchaser.

That we shall protect ourselves against any one making, selling or using any machine infringing any of our patents. Patented July 9, 1867; May 4, 1869; Dec. 22, 1874; Sept. 2, 1879; April 27, 1880. Patents applied for.

That we are, and have been, ready at any time, to make a competitive trial against the Triumph, or any other machine, for stakes of $1,000.

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Room 7, 109 California Street, - - - - SAN FRANCISCO, CAL

Nov. 6, 1882.

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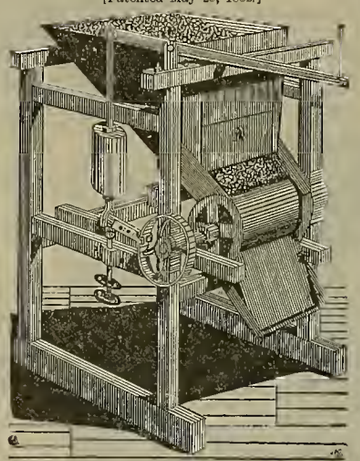
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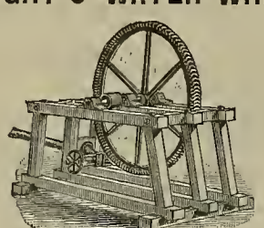
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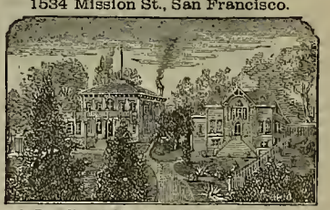
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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, DECEMBER 8, 1883.

VOLUME XLVII Number 23.

The Bower-Barff Process.

The Bower-Barff process is intended for the preservation of iron and steel from rust by forming upon their surfaces a film of magnetic oxide. Mr. A. S. Bower, C. E. of St. Neots, England, submitted a paper on the process, before the American Institute of Mining Engineers this year, and from this paper we make some extracts. The father of Mr. Bower, some 16 or 17 years before made a series of experiments on the production of heating gases, one set of them being the decomposition of water by passing superheated steam through masses of red-hot iron. He noticed that the iron became less and less active until it ceased to decompose at all, when, on examining it, he saw that it was coated with a kind of enamel. It at once occurred to him, on seeing this, that the process in question might be used to obtain such a coating, but he found after a few days' exposure of the iron to the atmosphere, that the coating shelled off, and he pursued the matter no further. The iron employed in this case was rusty, but if it had been new my father would, in all human probability, have been the accidental author of the process which Professor Barff discovered ten years afterward. I only mention this to show how advisable it is to investigate the causes of unexpected effects. Professor Barff's process consists in subjecting iron or steel articles to the action of superheated steam, and when they are at a temperature sufficiently high, three equivalents of iron combine with four of oxygen, forming one equivalent of magnetic oxide, and setting eight of hydrogen free.

Upon reading a description of the Barff process in the London *Times*, it occurred to my father that what the Professor could effect with steam he might also effect with air, and several experiments were made to this end, which were very varied in character, as were also the results obtained. The first was made with cast iron, by placing the articles to be treated in a cast-iron retort, heated externally, and then passing superheated air over them; and it was successful, while nearly all others afterwards were quite the reverse, as sesquioxide was copiously produced as well as the magnetic. Another experiment was made by placing a bar of polished cast iron in the main duct of superheated air to a blast furnace, and this, though covered with a red sesquioxide powder easily brushed off, had a thin, but very firm and tenacious, coating of magnetic oxide in contact with the iron. This bar has been exposed to the weather ever since, or over four years, without the slightest appearance of rust. Ultimately, when thinking over the fact that air is oxygen and nitrogen in mechanical combination only, I came to the conclusion that, to form the lower or magnetic oxide, the quantity of free oxygen, and so of the air employed, must bear some proportion to the surface of the articles exposed to its action, more especially when a comparatively low heat is employed. This is so, and it has been proved that the quantity of air passed through the retorts during the most unsuccessful experiments was 300 or 400 times more than was actually necessary. The reasons also why the first experiment was successful were that a great number of articles were in the muffle, that a very high heat was employed, and that the retort had been previously used for coal-gas making, and had a deposit of carbon in it, which to a great extent neutralized the effect of the large excess of air. All the unsuccessfully treated articles were red with sesquioxide outside, but there was nevertheless a coating of magnetic oxide in close proximity with the iron, due to the reducing influence of the metal in contact with the sesquioxide at an elevated temperature. The general appearance, however, of iron so treated was disagreeable, to say the least of it. The mode of action I then adopted was to admit a few cubic feet of air into the retort at the commencement of every half hour, and then to leave the iron and air to their own devices, the retort, of course, being tightly closed. During each half hour a coating of magnetic oxide was formed, and the operation was repeated as often as was considered necessary. Effective as this was for cast iron, the cost of producing the coating was as great as by the Barff process, for both of them required that the chamber should be heated externally, and this, with the large furnaces, is very expensive. Another plan that I adopted was to first find out approximately the extent of the surface of the goods to be treated by first dipping them into a tank of water of known area, lifting them out, and noticing the amount of water taken out of the tank by the wetted surface, and regulating accordingly a slow, continuous air supply by meter, of course keeping the temperature of muffle as nearly constant as possible. This, too, was successful, but the same objections applied to that mode of procedure as to the other.

The engravings on this page show two views of the furnace used in the process. Fig. 1 represents a longitudinal section. Fig. 2 is a transverse section. We shall give other views of the same furnace in the next issue of the PRESS. The hopper *b* supplies the producers for gasifying the fuel. The carbonic oxide from the combustion of fuel in the producers, passes along a conduit *d* (its flow being controlled by a slide *e*), to the openings *e*, where this combustible gas meets a current of hot air ascending through a passage *f*, and is consumed. The products of combustion are thence conducted along a passage *g*, where they are thoroughly mixed by open brick-work cross walls *h*, and then return along a passage *i*, whence they enter, through the oblong holes *l*, the chamber *k*, in which the articles to be coated are arranged. After having passed over and among the articles to be coated, the waste escapes downward through ports *m*, into regenerator chambers *p*, and thence to the chimney flue, heating in its passage the tubes *t*, composing the regenerator, and which are securely supported by the cross walls W. Cold air enters the apparatus at *r*, through a channel provided with a regulating valve under the control of the furnace tender. This air then passes along the lower rows of regenerator tubes and back through the upper tubes, thus becoming highly heated by the waste gases, and capable of developing greater heat when burned with combustible gas.

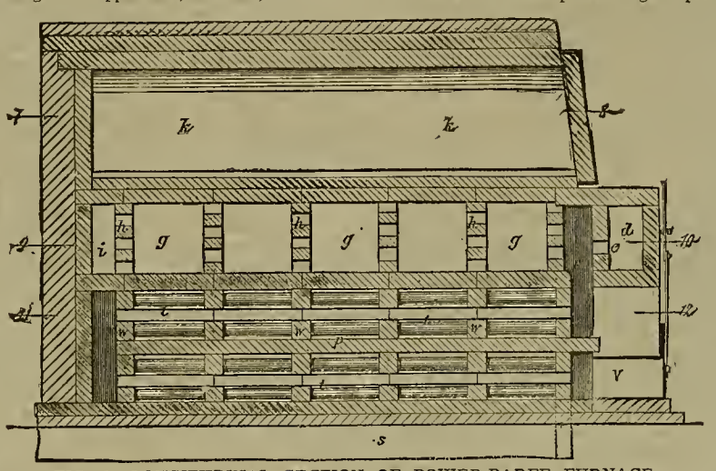


FIG. 1. LONGITUDINAL SECTION OF BOWER-BARFF FURNACE.

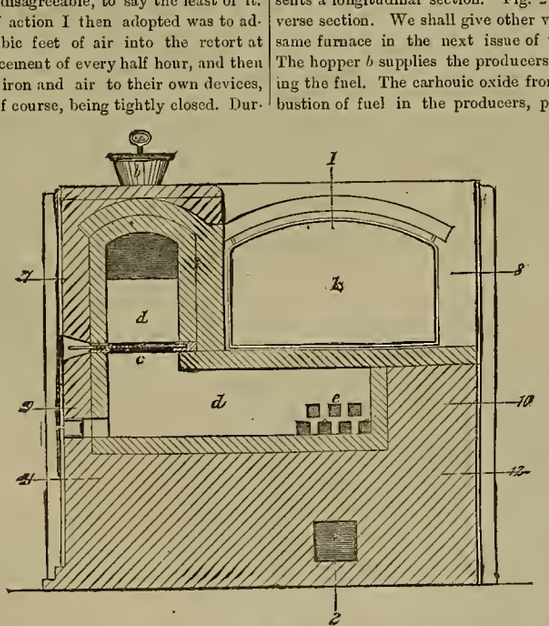


FIG. 2. TRANSVERSE VERTICAL SECTION OF BOWER-BARFF FURNACE.

Manufacturers' Association.

The Board of Directors of the Manufacturers' Association of California held a meeting this week, and reports read then show that twenty-two persons who signed the call for the formation of the Association have signed the by-laws, and nineteen have paid the initiation fees and dues, and the others who signed the call are expected to become members. Entrance fees have been collected amounting to $380, initiation fees reaching $125, and there is a cash balance of $391.40, the expenses reaching only $113.60. The Executive Committee are making a systematic canvass for members. The Chairman, Irving M. Scott, Vice-President of the Association, who presided in the absence of President A. S. Hallidie, thought that a more vigorous canvass should be made, and that 200 members should be secured in the next few months. On motion, the Judson Manufacturing Company, the California Iron and Steel Company, and the glove firm of Lippit, Leak & Co., were elected to membership. Mr. Scott said: "Some manufacturers are opposed to us, and consider this Association a clique who are going to run things to suit themselves, independent to the Board of Trade or other organization. I deny this most emphatically. We have no clique, and want to extend our membership as far as we can and include reliable firms."

Mr. Haraszthy favored these sentiments. The Association must not encroach on the rights of the Board of Trade, and care should be taken to this end.

In the discussion that ensued it was declared by one member that the Board of Trade was the most efficient organization of the kind in the world. It was thought by most of the members that mercantile ratings and such other questions as belong exclusively to the province of the Board of Trade should be scrupulously avoided by the Manufacturers' Association. At the next meeting a proposition will be taken up to allow all firms elected to membership to speak in open meeting, but each firm shall have only one vote. This plan was partly discussed and left for a meeting of the full Board of Directors.

THE Pacific Coast Steel and Iron Manufacturing Company has made a proposition to the people of Martinez, Contra Costa County, to establish works there if the town's people will take $100,000 of the $250,000 of the company's stock, to be paid for at the rate of $50 per share. It is the claim of the Pacific Coast Steel and Iron Company that it has a new process for the manufacture of the best grades of steel at very much reduced rates.

A NEW manufactory of flint glass has been established in San Francisco. The furnace will be ready in January, while blowing will commence in February.

CORRESPONDENCE.

Parley Park District, Utah.

[From our Traveling Correspondent.]

The Parley Park mine is considered an extension of the Ontario lead, and near by. This is under the superintendency of C. J. Nelson, and is owned by wealthy men of Pennsylvania who are members of the Pittsburgh Standard Oil Company. They feel assured they have here a mine, and have erected a steam hoist, have run their double-compartment shaft 965 feet deep, tapping the ledge at intervals as they descend, and find it dips at an angle of 70 degrees. They have very little water, as the Ontario has been disposing of that. They are working 25 to 30 men, making three shifts in 24 hours.

The Marsac S. M. and Mining Co., also in Park District, was organized in 1873, under the mining laws of Michigan. They labored under many disadvantages as distant owners and not able personally to supervise the initiatory works of the company.

In 1874 they expended nearly $100,000 in erecting a mill, expecting to get a supply of custom ore, which for various causes did not come forward, and their own properties were not then producing milling ores; so the mill was mostly idle till leased by the Ontario Company in 1876 and used by them over a year.

Since 1878 Mr. E. P. Ferry, from Michigan, has had charge of the entire property as Superintendent and President, residing at Park City, which town site is part of the Marsac land property; and thus enables business men to secure good titles to their business lots before erecting costly buildings. Mr. Ferry seems to be highly esteemed for the interest he manifests in the community affairs of the city, and his efforts to advance his own company's enterprises. He has thoroughly improved the mill, which now is described briefly as a 30-stamp dry crusher, 150 horse-power engine, 10 pans, 5 settlers, etc. A 60-inch Howell rotary roaster has a capacity of roasting 40 tons per day. The assay office, etc., complete; there are also carpenter and blacksmith shops, stable, and a good commodious business office. The mill is not now running. They expect to start it July, 1884, when they get their mine of free-milling ore more perfectly opened; but at present they are doing strong work on the Crescent mine, which is about 2½ miles from town. From this they are taking out daily 60 tons of ore, which is sampled and sold here to the smelters. They have shipped a large amount to the Castle Dome smelters, some to the Melrose works, California; and the Salt Lake and Omaha smelters also purchase.

During the last year they have taken out over 10,000 tons, worth at the mine $305,000. From this they declared a dividend of $150,000, besides making a large amount of permanent improvements in buildings, tramways, etc, this being the first year of its production. These are certainly very encouraging figures, and at the annual meeting, no doubt, the numerous stockholders will rejoice in a neat little dividend, and what is better still, a very satisfactory report of development work that means much better dividends in the future. The report will tell of three and one-half miles of tunneling in the mine, all connecting by shafts from one level to another. This vein is a blanket one, dipping eighteen degrees to northwest, with an average thickness of fifteen to twenty feet. The distance from the Marsac mine to the railroad depot at Park City is three miles. There are ninety-five men now working in the mine. These and many other little items that an outsider can not get will enlighten the stockholders at their annual meeting. I found the mining foreman, Mr. E. Porter, a practical business man as well as miner, and appreciated his hospitality, and took a miner's dinner in the miners' dining room; and if I am not mistaken, it was equal to Salt Lake's first-class hotel. The assay office is occupied by a very competent young man.

The Barry Consolidated Mining Co.

Was incorporated on October 12th, with a capital stock of $2,500,000. The claims are north of the Crescent mines. G. J. Barry, of Park City, C. B. Rustin, of Omaha, Joab Lawrence, et al., are owners. There are nine claims consolidated. The development capital is already paid in, and judging from the character of the incorporators, this means business. These Wasatch Mountains have many more undeveloped mines awaiting capital. On the same elevation or range is the Silver Key, working fifteen men, Dr. Furguson, foreman. They are not now shipping any ore, but are opening the mine more thoroughly.

The Apex Company is working twelve men, and selling ore in Salt Lake through the sampling house of McIntosh, Salt Lake.

Utah did her mines great credit in sending a very large and fine collection of ores and other mineral specimens to the Denver Exposition, under the care of Prof. Clayton, who arranged them with excellent taste. Since the organization of the

Mining Bureau of Salt Lake

They have made provision to start a permanent cabinet as the property of the Bureau, and have returned their specimens from Denver as a nucleus for a very full cabinet. They aim to collect the best scientific works and periodicals for their library. This organization is a movement of Utah's best business men, such as J. R. Walker, of Walker Bros., Joab Lawrence, Mr. Erb, of the Walker House, Prof. J. C. Clayton, and others, who recognize mining as a legitimate business, and as such is worthy of the best assistance that business tact and science can render it. The denunciations and anathemas that are heaped on

Mining as a Business

To-day comes almost entirely from those wholly unacquainted with the whole subject of mines—largely too from those who rush to every new camp with a small trunkful of socks and overhauls, with a few other cheap notions, and soon declare they have lost $10,000 by mining excitements, and they don't want to put any more money in mines. There are many men in Salt Lake City and in the mines of Utah that stand high in good moral and business society, who have no sympathy or liking for those who denounce and discourage this enterprise, that actually creates wealth in its most useable form from the worthless rocks of the mountains. It produces it as the common equivalent of all properties.

If man's necessities and the fertility of the soil argue for farming, why will not man's necessities and the mountains' abundant stores of wealth invite him as cordially to dig there as earnestly as in the potato field? I hear the objector say, we can raise potatoes without study, but to mine I must work hard with both mind and body. Legitimate mining is now and has ever belonged to and made a part of higher civilization.

While visiting the Iron and Steel Works of Colorado, employing an army of men and boys with blackened faces, none will fail to recognize the connection of their labors with our every advancement; or if you get on the Ontario Co.'s coal train and visit the Wasatch Coal mines, 18 miles below Park City, you will find 40 men working, aided by two steam hoisting works, and though all covered with coal dust you will find them a good average of intelligence and civility; and as you return to the well warmed hotel stove you can better appreciate the utility of that branch of labor.

"Park City and Environs"

Are highly favored in having an abundance of choice coal, very cheap; and I noticed many near the coal mines were simply going to the slack or waste piles dumped along the railroad track, and screening and loading up wagons with choice small nut-size coal, free.

Park City has a population perhaps of 1,500; has an excellent school, with male and female teachers sent out by the Chicago Educational Society, and make tuition free where parties are unable to pay. There is a Catholic and a Congregational church, a good hotel, and withal it is a town that does a nice lively business, and when the mines are developed will be much increased in size. The U. P. R. R. connects Park City with main overland route, giving that vicinity great convenience for development.

B. W. CROWELL.

Saving Snake River Gold.

The gold placers which exist along Snake River from near its headwaters to where it empties into the Columbia have for years attracted the attention of placer miners, but the fine gold has perplexed both miners and inventors to find a way to save it. One contrivance after another has been tried, only to be found nearly, if not quite, worthless. A new invention is now announced which gives promise of greater success. The Blackfoot *Register* has this in regard to the new method: "At last a machine for saving fine gold has been invented and put in successful operation at this point by Mr. D. O. Crane, of Washington, D. C., which works to perfection. It consists of a copper cylinder twelve or fourteen feet in length, with a rotating shaft extending through the entire length. Attached to this shaft at regular intervals are wings or blades, so arranged that the sediment in passing through is divided into thin sheets, exposing it to the surfaces of the wings and interior surface of the cylinder, all of which amalgamated, in fact the entire interior surface of the machine, wings, shaft and interior surface of the cylinder being thoroughly quicked. The shaft in rotating divides the sediment, besides washing it against the sides of the cylinder, bringing the light gold in contact with the amalgamated surfaces, where it is secured.

In making a test near this point Mr. Crane ran the tailings of the machine over burlaps, but not a color of gold could be found upon them, proving conclusively that the machine saved every particle of the gold from the dirt passed through it. Instead of being exposed to one surface, as on the ordinary plates, in this machine it is not only exposed to many surfaces but by the motion of the wings is thrown against the interior surface of the cylinder.

The machine is without doubt a perfect success, and will be the beginning of a new era in mining along Snake River. In the coming spring Mr. Crane and his partner, Fred T. Dubois, U. S. Marshal for this Territory, will place several machines along Snake River, which will add materially to the interests of those concerned in mining operations, and be of substantial benefit to the towns adjacent to Snake River."

Morris' System of Gold Amalgamation.

Mr. Frederick Morris, of this city, who has patented a combined amalgamator and settler, has devised a system of gold amalgamation, using his appliance, a description of which will be of interest. The machine is a combination of the ordinary pan and settler. It consists of a circular wooden tank, probably seven feet in diameter, with wooden dies and mullers, the grain of the wood running vertically face to face, and of a central discharge. Amalgamation of the gold particles with mercury is effected merely by rubbing the pulp and mercury gently together. This supplies the friction referred to further on in paragraph three. When amalgamation of the gold particles with mercury is effected, clean water is introduced into the settler and drawn off through the center post. This method saves float gold, spongy amalgam and floured mercury, claimed to be lost in the ordinary settler, in which the discharge is not at the center of the tank, and when iron bottoms and dies are used.

When a charge is drawn from the outer edge of the pan into an ordinary settler, a large proportion so drawn has never been to the bottom of the tank, and as the pan by grinding the pulp liberates certain base substances, by reason thereof the gold particles of floured mercury do not collect at the bottom. Now take the reasonable principles of Morris' theory and settler. 1st. When the charge is in and the gold particles amalgamated with the mercury water is introduced and is discharged through the holes in the center post until the water flowing off is quite clear. By the reason of an eddy formed at the center, all the base substances liberated by friction would be carried off by pure water, leaving the gold particles and mercury free to go to the bottom; as it is not possible for the gold particles or floured mercury to go from the outer edge to the center they must pass to the bottom, and by coming in contact with the wooden bottoms and mullers, the mercury is formed into bead and sinks into the grooves between the dies, and is not cut up as is usually done by the ordinary settler with smooth bottom, where the mercury is continually rubbed and cut up, not alone by the mullers, but as there is always some coarse stuff that has not been subjected to grinding, and will accumulate from each charge, that stuff, from its coarseness, is the very worst to cut up mercury and grind the amalgam, whilst the Morris settler has grooves or receptacles for the amalgam and mercury. In this machine any kind of chemicals can be used, as it is made of wood. In an iron vessel strong alkalies or acids can't be used to an advantage, as it will act on the iron before it acts on the fine particles of gold or mercury.

Mr. Morris' circular, from which these statements are taken, advances the following:

Theory of the System.

(1.) Gold is mechanically, not chemically, combined with any of the substances found therewith.

(2.) In a matrix inclosing sulphides of iron, arsenides, decomposed sulphurets, or "rusty gold," as is the case in most all gold mines, the gold particles are coated more or less with a film of oxide or tarnish, which prevents dried amalgamation with mercury. The gold particles may seem bright and clear to the eye and yet be coated. Therefore I would say to parties doubting my theory to try two pieces of bright iron. Subject one to a redhot shovel for five minutes and then throw both into mercury, and it will be found that the one heated will not take quicksilver. And why? Because the one heated has acquired a coating or tarnish of oxide of iron, neither of which is perceptible to the eye.

(3.) Stamping may abrade or remove the tarnish from a limited portion of the gold particles which may be present in a lot of pulp, and render the brightened particles free to amalgamate with mercury. But further friction will be necessary to remove the tarnish from the remaining particles, which usually constitute the larger proportion of the gold liberated in the ore.

(4.) It therefore only remains to "fine" stamp the ore without mercury in the mortars, concentrate and apply some rubbing friction with mercury.

(5.) The gain in friability, by subjecting pyritic ore to weather oxidation, is more than counterbalanced by the increase of tarnish on the gold particles, which makes amalgamation more difficult. The fresher the concentrates or tailings, the more rapid will be the amalgamation.

(6.) Iron rubbing against iron, as in iron pans and settlers amalgamation, ought to be avoided, because it tends to flour the mercury, and the chemical action, slight as it may be, set up between sulphides and metallic iron increases the tarnish on the gold particles, which tarnish must be removed before the particles amalgamate with mercury.

Concentration is the next question to be considered. There are many machines in use; but those mostly employed are the "Frue" and "Hendy" concentrators. * * * * The superintendents usually have no milling knowledge. They do not care how much precious metal is lost, and generally speaking the stockholders do not care as long as the superintendents send in dividends. But as soon as the ore becomes poorer and more expensive to mine, then the shareholders open their eyes and look for some one to work their sands or sulphurets. If he should earnestly endeavor to succeed all kinds of obstacles are put in his way, in order to force him to leave, as the employers have an impression that the millman will make too much money. Generally speaking, however, it is not the shareholders or directors who throw obstacles in the way of the millman; on the contrary, they are probably sorry to lose a man of the kind, because they may say if he can make money for himself he will make more for us. But as regards the superintendent, his thoughts will be, if that man can not be got rid of the shareholders can not help seeing my ignorance and incapacity.

(8.) As regards concentration, I would say my way would be to concentrate the gold instead of the sulphurets; to that end is my aim. My concentrator will concentrate concentrates to high standard, so that any method will pay to extract the gold. Generally speaking, a concentrator is valued according to how much sulphurets are saved. But as we have in many localities very poor concentrates, there my method would be of incalculable value. Take for granted what I say in paragraph 1 and paragraph 4. The gold can be recovered by my method 90 per cent. No skilled labor is required; therefore I will do away with the expensive graduates of "Freiberg or any other school of mines." It only requires good, practical, common sense men to make a success. I will undertake to concentrate tailings after any concentrator or machine that assays one dollar per ton, and make a profit ont of them. I am satisfied that the tailings from all the mills run contain an average of $2.50 per ton. By my method forty tons can be reduced to ten hundred pounds, and ninety per cent of the assay value of gold in the ore treated can be recovered by simple and cheap mechanical appliances.

(9.) "Chlorination" means an expensive process for extracting gold, and for silver it is impracticable. In order to extract the silver another process must be resorted to, namely, "Lixiviation." If silver and gold ore is treated in a furnace, and salt used to convert the silver present into a chloride, the soluble chloride can be extracted by lixiviation; therefore, it is necessary to first roast and lixiviate the ore in order to obtain the silver, then to extract the gold by chlorine gas. The most extensive chlorination works in the world are situated in Nevada County, California, where every skill and economy is used. The cost is not less than ten dollars per ton of 2,000 lbs.; now add five dollars per ton more for cost of lixiviation, then take the cost of concentrating one ton of sulphurets (concentrates). This will cost five dollars more, or a total of twenty dollars per ton of 2,000 lbs; then take 90 per cent of the assay value as the amount of gold extracted; it follows, therefore, that the stuff must be worth twenty-two dollars per ton of 2,000 lbs. to pay expenses.

Comparisons of Results.

Mr. Morris continues: Ordinary iron amalgamating pans (small ones) cost at least three hundred dollars each. They are expensive to set up, and wear out rapidly. The weight of the parts renders their use impracticable in mines difficult of access. Each pan also requires over five horse-power to drive it. In addition, two amalgamating pans are always worked in connection with a single settler, thus rendering the amalgamation and getting rid of the pulp two distinct operations. The Morris amalgamator and settler can be easily made at the mines, no matter what their position may be, at less than one-half the cost of an iron pan alone, while its durability is much greater. The wooden dies and shoes can also be quickly replaced at any time. About one-half horse-power is sufficient to run one machine and to treat three tons per day of twenty-four hours. The following table shows the relative quantities of gold obtained by the use of different gold-saving appliances:

	Assay contents of gold.
Morris' combination pan and settler	90 per cent.
Ordinary pan and settler	70 per cent.
Amalgamating barrels	72 per cent.
Tyrolese or Hungarian mills	70 per cent.

There is, therefore, no inducement to incur the expense and waste of power incident to the ordinary California pan and settler, nor the loss of gold consequent on the use of the pan, barrel or chloriuation systems.

HOW TO LOOSEN A TIGHT SCREW.—One of the simplest and readiest methods of loosening a rusted screw is to apply heat to the head of the screw. A small bar or rod of iron, flat at the end, if reddened in the fire and applied for a couple or three minutes to the head of the rusty screw, will, as soon as it heats the screw, render its withdrawal as easy by the screw-driver as if it was only a recently inserted screw. As there is a kitchen poker in every house, that instrument, if heated at its extremity and applied for a few minutes to the head of the screw or screws, will do the work of loosening, and an ordinary screw driver will do the rest, without causing the least damage, trouble or vexation of spirit. In all work above the common kind, where it is necessary to use screws, and particularly in hinge work and mountings, fancy fastenings and appliances affixed to joinery or furniture work, we would advise the oiling of screws or the dipping their points in grease before driving them. This will render them more easy to drive and also to withdraw, and it will undoubtedly retard for a longer time the action of rusting.

MECHANICAL PROGRESS.

Wire Cloth for Lathing.

Various forms of metal have been used at different times as substitutes for wooden lath, among which may be mentioned wire cloth, which has been extensively introduced. One of the chief claims of this material to favor is that by its use wooden buildings can be rendered practically fireproof. Cast and wrought iron beams and columns in building construction, unless they are thoroughly protected from the action of fire, are not to be depended upon. A comparatively low heat renders them useless, and in many cases buildings are thrown down by the expansion of the metal and the sagging of heavily loaded floors at a very early period after a fire breaks out. It is well known that firemen will refuse to enter an iron building for the purpose of fighting a fire, while they will contest the progress of the flames step by step in a building having wooden columns and floor beams. Since iron, to be entirely serviceable, must be incased in some non-conducting material, and since in many cases equally as satisfactory results are obtained from wood similarly protected, and withal at a much lower first cost, it follows that the use of wood in this general manner is becoming very common.

One of the best protectors of wood is mortar, and, accordingly, some methods by which the mortar can be held in place during the action of intense heat is a prime essential. Wire cloth used as lathing has been demonstrated by repeated trials to be satisfactory for the purpose. The particulars of a test recently made in New York, on the site of the old *World* building, may be of interest to our readers. A small building was erected, with walls of brick. It was covered with wooden beams, and common wood furring-strips were run crosswise, to which was fastened the wire lath. Two coats of mortar were applied in the usual manner and allowed to dry. On the day appointed for the trial a very hot wood fire was kindled and kept to the highest point for two hours by frequent replenishing. The fire was then allowed to go down, to facilitate investigation. It was found that the second coat of mortar, which had been artificially dried, had scaled off, but that the scratch coat was intact, not even a crack being visible.

The original intention was to have ended the test at this point, but it was determined to proceed to a still severer trial. Accordingly, the fire was again built, and wood was supplied for forty-nine minutes longer, the fire burning on the second trial for an hour, making in all something over three hours, during which the ceiling was exposed to a more intense heat than would ordinarily be experienced in a burning building. At the end it was found that the plaster had fully protected the wooden beams, demonstrating that the employment of wire lath will serve to confine a fire to the apartment in which it originates. The further claim is made that ceilings in which it is used will not crack, and that therefore it is specially adapted for fine work. It is used in the buildings erected by the Astor and Stewart estates, and employed in the Vanderbilt residences.—*Iron Age.*

A COMPOUND LOCOMOTIVE ON THE BOSTON AND ALBANY.—The adoption of the compound engine by ocean steamers a few years ago, and the resulting economy in fuel, set railroad men to thinking whether a similar plan could not be utilized for locomotives with profit. As a result, Henry Dunbar, of Hartland, Vt., has invented a four-cylinder, high-pressure freight engine which is expected to cause a saving of 33 per cent in fuel. The engine is now being built at the Boston shops of the Boston and Albany road and will soon be tried. It is an adaptation from a three-cylinder engine, invented by Mr. Webb, of the London and Northwestern Railway. In the Webb engine there was a large cylinder 26 inches in diameter directly under the smoke-stack, and on either side of this were two high-pressure cylinders 11½ inches in diameter. The Dunbar engine does away with the center cylinder, and has two 26-inch cylinders, each arranged in connection with a smaller one so that the latter shall exhaust into the larger, and thus utilize the steam a second time. The cylinders are so fixed that live steam can be used in all of them at the same time, thus giving an immense power; but the chief object is to utilize the exhaust steam. There are really two engines, independent of each other save so far as the rails may be said to couple the four driving wheels. The boiler will be so large that the engine can carry 160 pounds of steam, as do first-class passenger locomotives; but the drivers will be only 4½ feet in diameter. The machinery is the same as that of an ordinary engine, and if four cylinders fail to do the work expected they can be taken out and one pair put in. If, however, a saving of 10 per cent in fuel is effected, the engine will be voted a success.—*Springfield Republican.*

STEAM BOILERS.—A steam boiler, to produce economical results, should be constructed and set so as to permit a free combustion of the fuel and give sufficient volume of space for the hot gases to combine, in a manner calculated to effect the utmost production of heat due to the fuel consumed. Combustion of fuel is the chemical combination of the substance of the fuel with the oxygen of the air. A mechanical mixture is a composition in which the ingredients retain their natural properties; steam is a mechanical mixture of heat and water; atmospheric air is an invisible gas, produced by the mechanical mixture of two other gases, viz., oxygen and nitrogen. A chemical combination is an action in which certain elements and substances are absorbed and destroyed in the production of some other element or substance. Heat is a product of the chemical combination of the element oxygen with a combustible substance; and to produce the maximum volume of heat from a given weight of fuel, it is necessary that a proper quantity of oxygen, under correct conditions, be admitted to the furnace and combustion chamber. The maximum rate of heat having been provided for, the surface of the boiler exposed for its operation should be of sufficient extent to allow the necessary time for transmission of heat to the contained water. When the heating surface is insufficient, the heat is certain to be carried through the flues or tubes and into the up-take before it (heat) can be absorbed to an economical extent. There must be, also, ample room for the escape of steam to the surface of the water; and after it has passed above the water it would seem as though it was necessary to bring it (steam) again in contact with some heating surface to thoroughly complete the evaporation and even superheat the steam slightly before it is finally allowed to pass to the engine.—*American Locomotive Engines.*

COTTON BELTS.—An advocate of cotton belts says: "Woven belts give and take. This is the nature of a woven material. When first put on, they require 'taking up' once or twice more than leather. The stretch is approximately six per cent as against four per cent in leather; but once well to work they give less trouble, as there is but one joint to look after. If put on really tight enough, this stretching is minimized to a great extent. Users are afraid to overstrain the belt, but the extraordinary result attained by certain experiments made as to tensile strain shows the impossibility of breaking a belt under fair conditions." The capital advantages claimed for the transmission of power by means of belting are intensified, as it were, by the use of woven bands. Thus, with gearing we have cumbrousness, noise and vibration; disaster following upon an obstruction or breakage in the machinery, and unsuitability for high speed. Such liabilities are avoided by the use of leather belting to some extent, but very much more so if a belt less cumbrous than leather, less weighty, working more quietly and smoothly, with more elastic stretch to sustain a sudden shock, and more suited, owing to its extreme pliability and light weight, to high speeds. In the use of belts it will be found to be much more effectual and satisfactory to decrease their tension and increase the diameters of the pulleys or width of belts rather than run them too tight. More than one instance could be chronicled where as high as 15 per cent of the power used was consumed in overcoming friction caused by tight belts.

NEW DEVICE FOR GENERATING STEAM.—Late English papers speak of a new device for generating steam, which is described as follows: The device is a smokeless locomotive driven by steam, but without any fire. The inventor is the engineer Honigmann, in Grevenburg, by Aix-la-Chapelle. His system consists of a double boiler, the larger one being filled with fresh water, and inclosing a smaller one filled with a solution of salt. If now the water is heated to 145° cels., the engine has a working pressure of three horse power, and when it is put in motion the exhaust steam will enter into the solution of salt, where it leaves its heat, which again produces steam until the solution is saturated with water, and therefore unable to retain the heat. Such an engine is capable of working during four or five hours without giving off smoke, and it is said that in many instances it will in consequence rival the electric locomotive.

WOOD-WORKING MACHINERY.—The manufacture of wood-working machinery has developed at a wonderful rate during the past ten years. Where, formerly, the business was mainly confined to a number of large concerns, there are now a great many small establishments engaged in the business. It is safe to say that no line of machinery has made greater strides towards perfection than this, and many of these small establishments will probably ere long develop into wealthy corporations. The manufacture of lumber and its subsequent manipulation are properly recognized as among the leading industries of the United States.

THRASHING BY SUN HEAT.—A French inventor who has patented a machine for the use of concentrated solar rays as a general motive power, has set up three of his machines in Algeria for the French government. He is now carrying on experiments at the Island of Porquerolles, near Hyeres, in France, where he is thrashing Indian corn and raising water by the action of the sun's rays.

BAND SAWS DODGE.—They can be made to bear a great number of the moderate flextures required by sufficiently large wheels, and can be guided very successfully at the points of entering and emerging, but no practicable amount of skill can make them saw in absolute planes through thick and knotty wood.

SCIENTIFIC PROGRESS.

Astronomical Collisions.

An article in a late number of the *North American Review*, by C. A. Young, Professor of Astronomy at Princeton, N. J., presents some interesting points in regard to the probability of collisions between worlds. It contains a good many statements of fact with which the ordinarily intelligent reader should be familiar, but they are well selected to bear upon the subject which has agitated so many minds as a result of unauthorized predictions by some and overdrawn deductions by other persons who have written on the topic. He says that while the possibility of collision remains, the chances of two stars accidentally jostling each other is far less than that of the collision of two bullets in mid-air over a battle-field. The average distance from star to star, throughout the range of the region commanded by the telescope, is about 9,000,000,000,000 miles.

If ever two great worlds should really meet in this way, some of the consequences can be predicted. If, for instance, our earth should meet another globe like herself, and moving with the same velocity, heat enough would be generated by the shock to transform both into a huge ball of vapor. Unless the central core of the earth is much colder and more refractory than usually supposed, the quantity of heat developed would be sufficient to completely vaporize a globe of ice 97,000 miles in diameter, containing 160,000 times as much matter as both the colliding worlds. If, however, the masses were chiefly gaseous to begin with, as our sun seems to be, the effect might be curiously different. Heat would be generated to just the same extent as in the case of solid bodies, but the result in nebula might be actually cooler than was either of the bodies before the encounter, owing to an immense expansion in volume, though immediately after the shock, and before the ultimate expansion in bulk was attained, the temperature and brilliancy of the mass would for a time vastly increase.

In regard to the consequences of a comet's collision with the earth, it is impossible to predict them with scientific certainty; but they would probably be insignificant. The quantity of matter in a comet is small; it is probably, throughout, only a cloud of dust and vapor—a mere smoke-wreath—and has not any solid kernel as a nucleus. If, however, the comet has really at the center of its head any great mass of stone or iron, or even a closely packed swarm of aerolites weighing a ton or two each, collision with it would be a very serious matter, spreading devastation and conflagration over perhaps half our globe surface at once; not amounting probably to any thing like a destruction of the world, but far more disastrous than any earthquake or volcanic eruption. It is far more likely, however, that the encounter with a comet would simply cause a magnificent but harmless shower of shooting-stars, lasting an hour or two, which one might desire to see.

As for the effect of a collision between a comet and the sun, the probability is that we should never know of it unless we happened to be expressly watching the event. For a few minutes, just as the nucleus was piercing the photosphere, there might be an unusual flash of brilliance and a fine outburst of solar prominences, followed by intense magnetic and auroral displays on the earth. But the chief thermal transformation of the impinging energy would be effected far below the visible surface of the sun, and would result in an expansion of his bulk far too slight to be detected by terrestrial astronomers.—*Chicago Tribune.*

CLOUD INDICATIONS.—Some of the oldest text books, or the reading books of the present mature generation, show by text and illustration the shape and proportional construction of clouds, giving their names; as, the *cirrus*, *stratus*, *cumulus*, *nimbus*, and their names compounded. A recent contributor to our cloud knowledge is an English meteorologist, Rev. W. C. Ley, who has initiated the appearance of the clouds as a study, by means of photography. He claims that by observing cloud forms he can predicate rain from the surface of a cloud which may be forty miles away. His plan comprehends the material as well as the forms of clouds. The *cirrus* is an ice cloud, sailing at an altitude of from three and a half to seven or eight miles above the general surface of the earth, and with a very high velocity, at times exceeding that of a locomotive. The icy structure of the upper clouds is evidenced, not only by the fact that at the levels on which they move the temperature must be extremely low, but by the fact that the halos and mock suns, formed by *cerri*, can not be explained in accordance with optical laws, except on the hypothesis that the light is refracted through minute prisms of ice. "Outlying streaks of this cloud, often from twenty to one hundred miles in advance of the main pack," he shows, serve as "the pioneers of the coming army"—those alternated threads of ice crystals, between five and eight miles above the earth, arranged in parallel lines, gradually overspreading the sky with a milky-looking film of whitish cloud matter. This stage occurs at a place lying in the storms' track before the barometer gives any warning, and sometimes while the mercury in the weather-glass is rising. Thus the trained observer may consider these clouds as storm signals, advertising by their peculiar movements not only the coming of the storm but also the bearings of its center.—*Scientific American.*

MEN AND ANIMALS.—We are distinguished from the animal creation by the magnitude of the brain, by the complication and perfection of the nervous system; and the whole force of life, its emotional force, its thought force, its will force, resides in the nervous mass of the brain and in the nervous system of the body; and he who keeps that healthy is competent to all the functions of existence, and he who draws on that draws on his capital. A healthy nervous system is one in which every night a man makes up what has been expended in turning the wheel of industry through the day: is one in which food and sleep make up, every twenty-four hours, all that a man has wasted, and supplies some surplus. There are a variety of ways in which men draw off the vitality of their whole brain and nervous system. Excessive virtuous industry does it. It makes no difference whether a worm eats its way into a wooden cistern or whether a hole is bored into it with a gimlet, or whether heat shrinks the stuff, its contents run out all the same; and no matter what it may be, any thing that sets the nervous system afoot will drain it dry speedily, and leave a man a wreck. As soon as a man has wasted with riotous living the substance that lies inside the brain and nervous system he is good for nothing. That is the vital part of every human being: it is the capital of a man's life, and when one has squandered that he is beggared and bankrupt beyond all description. The first thing we know, down goes one man paralyzed; down goes another man from softening of the brain; down goes another man with Bright's disease.—*Henry Ward Beecher.*

A REMARKABLE ELECTRICAL DISCOVERY.—The London *Times* of August 31st states that a new electrical contrivance has been perfected by Mr. A. St. George, the inventor of the telephone which bears his name. This invention, which is really supplemental to the telephone, will enable every description of conversation carried on through the instrument to be not only recorded but reproduced at any future time. Briefly stated, Mr. St. George's invention may be thus described: A circular plate of glass is coated with collodion and made sensitive as a photographic plate. This is placed in a dark box, in which is a slit to admit a ray of light. In front of the glass is a telephone diaphragm, which, by its vibrations, opens and closes a small shutter through which a beam of light is constantly passing and imprinting a dark line on the glass. Vibrations of the shutter cause the dark line to vary in thickness according to the tones of the voice. The glass plate is revolved by clockwork, and the conversation as it leaves the telephone is recorded on the sensitive plate, the imprinted words spoken being fixed as is done in photography. The plate can be brought forward afterwards, and when replaced in the machine and connected with a distant telephone, will, when set in motion, give back the original conversation.

COLORADO'S GRAND CANYON.—Prof. Archibald Geikie remarks, concerning the future history of the grand canyon of Colorado, that it has still about 1,000 feet to remove from the bottom of its channel before its slope will become so slight that its erosive power will nearly cease, and that it is conceivable that, should no geological revolution occur in that region, the canyon may still be deepened to that amount. There are indications, however, that a limit may be set to the possible depth of the chasm. As in the so-called "creep" of a coal mine, the bottom of the canyon, relieved from the weight of the over-lying column of rock, may be forced upward by the pressure of the walls on either side. In that case the channel might rise as fast as the river cut it down, so long as nothing occurred at the surface to materially diminish the bight of the wall.

HARDENING SOFT LIMESTONES WITH FLUOSILICATES.—The application of alkaline silicates to the exterior of buildings, in order to prevent the deterioration of the stone, has not been attended with satisfactory results. H. L. Kessler proposes to use a solution of fluosilicates of bases whose oxides and carbonates are insoluble in a free state. When soft limestone is saturated with a concentrated solution of a fluosilicate of magnesium, aluminum, zinc, or lead, a very considerable degree of induration is soon reached, and the resulting products, except the liberated carbonic anhydride, are less soluble than the stone itself. No varnish is formed, and therefore no danger arises from expansion of frost beneath it. The process has resisted the severe tests of winter. Colors may be introduced satisfactorily.—*Les Mondes.*

GAS AND ELECTRICITY FOR LIGHT.—Foreign journals report an arrangement for producing brilliant light by the combination of gas and electricity. It consists of an ordinary gas flame, through which passes a curved metallic rod provided with means for counteracting the effects of overheating under the action of the current. A cool, bright light is produced, of far better quality than gas alone. The report states that the platinum does not require a great intensity of current to make it supply an ordinary light with one or two small elements. The cost is said to be a third less than that of the gas supplied by the gas companies.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

SOUTH SPRING HILL.—*Ledger*, Dec. 1: The recent strike of ore in the South Spring Hill holds its own. The ore body has been followed 60 ft in length 10 ft in hight and 5 ft in thickness. It may be much more extensive every way. More than this, it maintains its high grade throughout. The mill is being put in readiness for crushing as rapidly as possible. From 15 to 20 men are employed about the mine. An ore dump has been constructed, and a wagon road is being made from the dump to the road.

CONFIDENCE.—This claim is near Butte City, about 2½ miles southeast of Jackson, and is owned by Hageman, Matson and Fleming. The 5-stamp mill was started again Monday, with every prospect of a long run. The tunnel is in 180 ft, the ledge has widened out to 4 ft, and looks better than the first lot run through, which yielded over $10 per ton in free gold. There are 9 men employed about the mine and mill. The 5 stamps crush 12 tons per day, and 500 or 600 pounds of sulphurets are saved every 24 hours. These sulphurets are worth from $120 to $130 per ton, sufficient of themselves to pay the running expenses of the mine.

AMADOR CON.—No superintendent has been appointed to take the place of D. T. Davies, resigned. The mine is in charge of Elias Pitchard, and the mill under Hiram Deacon. F. B. Latham, secretary of the company is still in Sutter Creek, taking the general oversight of affairs.

NOTES.—Mr. Pilsbury, who is staying at W. A. Nevill's near Middle Bar, received a dispatch dated Nov. 27, from El Dorado, El Dorado County, that a rich strike had been made in the Starlight mine. Between $10,000 and $20,000 was taken out in a short time. The mine is an old one, from which hundreds of thousands of dollars have been taken out in early days by the Mexicans, and all above the water level. James Stewart is taking out ore from his claim near Butte City. J. C. Mello is sinking on his quartz claim near Big Bar bridge. The Zeile mill is now running the full 40 stamps by water power. I. N. Dewitt and others are ground sluicing at Murphy's ridge. The new ditch to the Mammoth mine was finished Thursday. At the big tunnel at Middle Bar, a change in the contract was made this week. The tunnel is in 300 ft; the face in soft slate. Eighteen men are pushing the work ahead as fast as possible, making about 8 ft every 24 hours.

AMADOR CON.—The *Sentinel*, of 28th, says: D. T. Davis, who has been superintendent of the Amador Con. mine for the past 7 or 8 years, has gone to Washington territory to superintend a coal mine. There will be no ehange at the mine at present, Mr. Pritchard, who has been the underground boss, will take charge. At the 300 level they are drifting north and south and have struck some very good rock south.

El Dorado.

NASHVILLE.—Placerville *Democrat*, Dec. 1: The Nashville mine, owned by Joshua Hendy, of San Francisco, is proving to be a veritable bonanza. The shaft is now 520 ft deep. Sinking has been stopped for the present, and a drift is being run south from the 500 level; it is now in 37 ft. The ledge at this point is 7 ft wide, the ore of a high grade, and indications point to an immense body of it further south. The mill was started up several days ago, but from a lack of power they have only been able to run 10 of the 20 stamps. Mr. Knight, of the Sutter Creek foundry, came over to-day to arrange for some alterations in the water-wheel, and in a few days we may expect to hear the clatter of the other 10 stamps. On account of the above-mentioned trouble with the water-wheel, and not from a lack of ore, the mill has not been run very steadily, but the amalgam is filling up on the plates in a manner calculated to make glad the heart of Joshua Hendy.

LONE STAR.—Mr. Heald's mine, the Lone Star, is situated 1½ miles south of Nashville, on the mother lode. It has been prospected to a depth of 90 ft, showing a well defined ledge of good milling ore of an average width of 6 ft, and prospecting in places as high as four bits to the pan.

CUMBERLAND.—The Cumberland, Mr. Hart's mine, is just across the river from Nashville, immediately north of and adjoining the Nashville mine. It was worked in early days under the name of the Montezuma mine, turning out some very rich ore which was crushed in one of the first, if not the first, mills built in El Dorado County. During the past summer Mr. Hart discovered a new pay chute upon which he has sunk a shaft about 50 ft. It shows as pretty a ledge as is to be found in the county, and the ore is of a high grade.

STARLIGHT.—In a former letter I gave you a description of the Starlight mine, about 1½ miles south of this place. J. C. Boyd has been appointed superintendent, and under his management very rich rock has been taken out, and about one week ago I was shown one specimen weighing about $8 of pure gold. But to cap the whole thing, he took out on last Friday about 80 pounds of rock that seemed to be half gold, and the same was variously estimated by those who saw it to be from $2,000 to $10,000.

EUREKA.—Georgetown *Gazette*, Nov. 30: The new stamp mill on the Eureka mine will be ready to start up on or about the first of January. The work is being well done, and will be first-class in every particular.

VOLCANOVILLE.—R. G. Hart of the Flora drift gravel mine near Volcanoville, who has a large force employed, was in town this week purchasing supplies. A four-horse load went up Thursday.

Fresno.

RICH STRIKE.—*Expositor*, Nov. 28: John Krohn informs us that Floyd, Dods, Strombeck and others have just made a very rich strike in their mine on French Gulch. They struck ore that they feel certain will pay over $100 per ton. They have leased an arastra and will commence crushing at once.

Mariposa.

VIRGINIA MINE.—*Gazette*, Dec. 1: The work on this mine is progressing rapidly. They are running two tunnels, the old Coe tunnel and a new one above. They have a fine vein of gold-bearing quartz in the new tunnel, in which considerable free gold can be seen with the naked eye. Mr. Mast intends starting up the mill as soon as the mine is opened sufficiently to keep the mill constantly running.

Mono

BYRANT.—Bodie *Free Press*, Dec. 2: James McDonald had a sample of Bryant sulphurets assayed by Soderling, a few days ago, and the result was $2,992.40 a ton. As the ore contains a good percentage of them, it would be quite an object to save them. Nearly all the ores of Homer District are rich in the same manner, independent of the free gold they contain.

STANDARD CON.—Bodie *Free Press*, Nov. 28: Extracted and shipped to the mills, 1385 tons of ore. Received 1900 ounces of crude bullion, and shipped to the company $12,858.23. Upraise No. 1 from north drift No. 2, 1000 level, has been raised during the week 7 ft; total length, 40 ft, vein 4½ ft wide and looks well. North upraise No. 1, from north drift No. 4, is up 170 ft, and is all in ore. North upraise No, 2, from same drift, is up 80 ft all in ore.

BODIE CON.—During the week ending 24th inst there were 222 carloads of ore hoisted from the mine. The average assay value of the pulp was $15.39 per ton; that of the tailings was $3.77.

BULWER CON.—The north drift, 700 level, has been advanced during the week 20 ft; total length 450 ft, with no change to note.

BODIE TUNNEL.—The north drift 200 level, has progressed 11 ft, and south drift, 300 level has been advanced 10 ft during the past week.

THE SUIT DECIDED.—Bodie *Free Press*, Nov. 29: About 11 o'clock Saturday night the jury in the Holmes case sent word that they were ready to report, and as soon as the lawyers could be got together they rendered their verdict for $360,000 against the Northern Belle. The Holmes folks will have to take the Northern Belle mine as it is, for they do not expect stockholders to pay an assessment large enough to pay the judgment. W. W. Hobart, who was in the interest of the Northern Belle, says the Northern Belle folks will never pay the judgement. He says they made the fight as a matter of pride, for, in fact, the Northern Belle is worked out and is almost worthless.

MAY LUNDY.—Bodie *Free Press*, Nov. 27: Saturday last 75 men were discharged from the May Lundy mine, for what reason is not learned. It was hoped that the new company which, it is said, is to take hold of the May Lundy, would employ a large number of men this season and give the camp a start and it may be so yet.

Nevada.

NOTES.—*Transcript*, Nov. 29: At the South Yuba River mines the flume and undercurrent are being constructed and the river can be turned through the tunnel by December 10. At the Charronat the work to substitute water power for steam in running the mill and hoisting works is being pushed, and they are about to begin laying the iron pipe to bring water from the South Yuba Co.'s new ditch. It will take 2 weeks. Thomas, Hampton & Co. have had a crushing of ore from their mine in Willow Valley made at the Deadwood mill. The yield was between $20 to $25 a ton. The Nevada City Co. are about ready to open a new level at the depth of 750 feet. Drifts will be run north and south on the ledge. Fine ore is being extracted from the 450 and 600 levels. The Derbec Co.'s new drain tunnel has tapped the old workings. It was raised 10 ft towards the last to prevent a rush of water, but the connection was made unexpectedly and for a short time the men were demoralized, anticipating that they would be flooded out. Fortunately the stream was not a strong one and no damage was done. Hussey & Hussey started up this week the new hoisting and pumping works on their claim in Willow Valley. The machinery works admirably The hoisting works and mill on the Birdseye cement claim near You Bet are nearly completed. Every thing will be in readiness to start the machinery by Saturday.

NEVADA CITY MINE.—Pres. Shoecraft says it was the intention of the Nevada City Co. to double their milling capacity this fall, but the Board of Directors concluded to wait till spring. The Nevada City is one of the big mines of the state. Twice as much ore is being extracted right along as can be crushed in the 20-stamp mill, and good judges figure that there is at least half a million dollars' worth developed. Occasionally some remarkably rich deposits are found. A sample of the latest bonanza is at the Citizen's Bank. It is as big as a man's head and contains over $600 worth of gold.

EMPIRE MINE.—The *Union* says: The mill has been thoroughly overhauled, new mortars put in, self-feeders introduced, and other new improvements made. The cost of the improvements will be about $17,000. In the meanwhile the underground work of the mine has been going on as usual, and there is a large quantity of good ore accumulating.

WYOMING.—At the Wyoming mine a new spur wheel, pinion wheel and pump bob are being put in, and a stone foundation laid for the pumping engine. These changes will take 3 weeks, but work in the mine will not be interfered with as the water will be baled out with the hoisting engine.

MAGENTA.—*Union*, Nov. 28: The shaft of the Magenta mine has been pumped out and sinking will be commenced the last of this week. The shaft is 365 ft deep, and a new level will be opened at the depth of 400 ft. An 18-inch ledge now shows in the bottom of the shaft which prospects well in free gold.

CANADA HILL.—Weisenburger & O'Hearn have entered into a contract with the Charonnat Co. to take out 100 tons. They have struck fine looking rock. Samuel Barr is working a ledge that prospects well. Lately a streak of very rich ore was met with, which increases in size and quality as work progresses. Other ledges in the neighborhood of Canada Hill are looking well

Placer.

ALTA MINE.—Dutch Flat *Times*, Nov. 24: Work in the new shaft in the Alta mine was shut down Saturday. The suspension is only temporary. The supply of water in the shaft had become so great it was more than could be kept out with the buckets and horse-power hoisting apparatus, and work was suspended until a boiler and engine could be secured and a steam pump placed in the shaft. When work was suspended the shaft was down to a depth of 140 ft. Many fine specimens have been taken from the gravel, and the company is very sanguine of striking good pay at the bottom, which is expected to be reached at 210 ft.

PINO.—*Herald*, Dec. 1: The Laird mine is now running in full blast, and the new mill is doing excellent work. The amount of dust cleaned up seems to be entirely satisfactory to the company.

Plumas.

GARFIELD.—Greenville *Bulletin*, Nov. 28: The new ore house at the Garfield mine was finished some days ago, and is now being filled with ore. The vein at present is 4½ ft wide, and looks well.

San Bernardino.

BELLE MCGILROY GROUP.—*Calico Print*, Nov. 30: In the Belle McGilroy mine a tunnel about 200 ft in length has been run in, cutting three bodies of ore of a paying quality. In the tunnel are three shafts, the first, 65 ft from the surface, and the other two about 40 ft each. Besides these there are several small openings. There are 400 tons of ore on the dump, the value of which can be determined by the fact that about 30 tons of the same character of ore were crushed by the Bonanza King Co.'s mill which realized in bullion $125 to the ton. The owners of this group are P. R. Dyer and Richard Gorman.

MOZART.—The Mozart group adjoins the Belle McGilroy on the south, and consists of the Mozart, Blue Blazes and another. Two shafts have been sunk in the Mozart mine, each about 95 ft deep, in the bottom of which is seen a good showing of ore similar in appearance to that of the Bonanza King, and which assayed $325 to the ton. Another shaft 35 ft in depth has also been sunk. A tunnal about 50 ft in length has been driven in, besides several cuts and openings. There are 30 or 40 tons of ore on the dump.

SHENANDOAH.—The Shenandoah mill and mine on La Mesa is still hammering away; the shaft is now down about 175 ft with an 8 ft ledge of 40-dollar ore in the bottom. They get more than ore enough from the shaft to keep the five-stamp mill running, the clean up from which last month for a fourteen-day run was over $3,000.

Shasta.

SUNNY HILL.—Cor. *Courier*, Nov. 30: The Sunny Hill mines are progressing steadily. It is now conceded that the Gitupandgit, the Spencer and Charles Kaberner claims are all one and the same ledge. They are in a direct line, running northwest and southeast—having for their hanging wall a porphyry ledge varying from 4 to 12 ft wide. This is perhaps the greatest find ever made on the coast. The ledge so far as prospected extends over a mile and a half in length.

SPRING CREEK.—Stowell was down from his upper Spring Creek mine Wednesday. During the past summer he has put up a house, and this winter he will work in the tunnel, which he is running to tap his ledge. From the surface prospects, it is evident that he has a claim something similar to the Iron Mountain bonanza.

Quite a lot of ore has been brought down from Iron Mountain this week, and we understand that a wagon load per day will be brought down next week. The last sent below gave very satisfactory results.

NOTES.—*Democrat*, Nov. 28: Levi Day passed through town to-day on his way to the East Fork mines to haul quartz to the arastra. The company will start crushing next week. They feel confident of good returns. From Pat Lawton who has lately come in from Eastman's Gulch, we learn that J. C. Hickey has again struck his ledge by a 400 ft tunnel. The ledge is struck at a depth of 200 ft and is from 15 to 20 inches in width, and prospects at the rate of $60 to $70 to the ton. Dan O'Neal returned from the city the first of the week, having purchased his quartz mill. It will be shipped up in a few days, and Dan will probably be crushing before the first of the new year.

Sierra.

BALD MOUNTAIN.—*Messenger*, Nov. 24: Sunday the Bald Mountain Extension Co. cleaned up 23 ounces from 75 carloads. There was but little water. Wood is being hauled to the Pliocene shaft, and in a few days pumping will be resumed, and enable the company to wash the rich gravel accumulated in their large dump.

HOG CANYON.—Thursday, A. W. Bishop, of Oakland, called on us. All their winter supplies are laid in, and sinking has been commenced on two ledges. They are down 30 ft on one, and 15 on the other. One of these is a 4 ft ledge. Ore pounded in a hand mortar averages $12 to $16 a ton. Sufficient rock will be taken out this winter to warrant the building of a mill next spring. Six men are employed.

EGGLESTONE AND MOWRY.—The undivided one-half interest, including mine, ditch, tunnel and the appurtenances thereto attached, was appraised at a little over $6,000, and individual property $2,000. The Egglestone and Mowry mine contains one hundred and nineteen and one-half acres, and all or nearly so pay ground. The mine yielded handsomely this season's run.

JUNCTION MINE.—The Junction mine was first located about 20 years ago, and several thousand dollars sunk in running tunnels to develop the mine. Mr. J. B. York inspected the old works and came to the conclusion that it was a good mine, and formed a company and relocated it. His partners proving to be too slow-going to suit him, he bought them out. Though laboring under many disadvantages, he pushed right ahead. For reducing the ores a 12 ft arastra is used. Though a slow process, the results obtained for the last season's run were very satisfactory. Mr. York has no thanks to offer the wet blanket element. The lode is well defined, walls nearly vertical, vein averaging 3 ft thick. As far as the vein has been explored, it has all the characteristics of permanency. Not a pound of rock taken out of the mine last season, but what, including that on the old dumps and scattered about on the hillside, was gathered up and put through the arastra yielding $15 per ton. There are but a few mines in the county that can show better results.

Tulare.

KAWEAH RIVER.—*Delta*, Nov. 22: Edwards & Stevens recently sent a sample of the rock from their mine to the State assay office, and received a certificate of assay showing one hundred dollars and forty-six cents in gold per ton, and seventy-eight cents in silver. Mr. Barton, who has lately constructed a water arastra, on the Kaweah river, for the purpose of milling this rock started his machinery last week, and on Saturday had crushed three tons. The mine is seven miles from the mill, with which it is connected by a level road. The wheel of the mill has power to run four arastras, and the water power is sufficient at the lowest stage of the river, to run thirty. One fact connected with this river seems to explain why no placer diggings have been found in this part of the State. It is seldom that a single particle of gold is found in the rock large enough to be seen, but when an ounce of rock is crushed and washed in a horn spoon a cloud of flour gold is revealed.

NEVADA.

Washoe District.

HALE AND NORCROSS.—*Enterprise*, Dec. 1: On the 2700 level the north drift was advanced to a point about 80 ft north of the station, and on the 22d work was temporarily discontinued in order to resume sinking the incline winze below the 2700 level. The winze is making good progress in favorable ground. At the point where work was discontinued they had a streak of very fine ore 15 inches in width. Assays of this were from $20 to $600.

UNION CON.—The double cages are working well. The main north drift from the 3100 station is out 40 ft. It will be pushed on a direct course for the main north drift with which it is desirable to make connection as soon as possible.

COMBINATION SHAFT.—The new hydraulic pump is now being shipped to this city. All is in readiness to receive the pump, which can be set up in about 10 days.

IMPERIAL.—The west drift from the 600 station is being pushed as rapidly as possible for the works in the old upper level. It is out about 200 ft. Once this drift has reached its point, explorations will be commenced in the old ground of the Alpha, Exchequer, and Imperial.

SIERRA NEVADA.—The upraise from the 2900 level is being advanced at the rate of 15 ft per week in favorable ground. On the 3100 level a north drift will be started in a few days from the joint Union Con. station.

ALTA.—Good progress is made in draining the mine. The water is out nearly down to the 2150 level.

UTAH.—Good progress is making in repairing the incline upraise on the 1350 level connecting with the 1200 level at the south line of the ground.

BEST AND BELCHER.—The joint Gould and Curry winze is being sunk and timbered at the rate of 15 ft per week. The bottom is in ground of a favorable character.

GOULD AND CURRY.—The joint Best and Belcher winze that is being sunk below the 2500 level is down nearly 90 ft. The bottom is in ground of a favorable character.

MEXICAN.—The main north drift on the 3100 level has now passed across the north line and is being advanced in the ground of the Union Con. Co. The drift and upraise on the 1600 level are being repaired.

CROWN POINT.—About the usual quantity of ore is being extracted and shipped to the mills on the river.

OPHIR.—Are extracting the usual amount of ore from the 150 level. This ore is being reduced at mills on the Carson. On the 1600 level the drift and upraise are being repaired.

YELLOW JACKET.—About 100 tons of ore per day are being extracted and sent to the mills.

ANDES.—The face of the north drift still continues in quartz of a promising appearance. The south drift from the winze is in quartz that gives promise of ore.

BELCHER.—A considerable amount of ore is being extracted from the old upper levels, and a good deal of exploring work is being done.

CALIFORNIA.—The joint Con. Virginia winze on the 2700 level is being sunk and timbered at the rate of 12 ft per week.

CON. VIRGINIA.—The joint California winze on the 2700 level is being sunk and timbered at the rate of 12 ft per week.

OVERMAN.—Some low grade ore is still being extracted from the old upper levels.

THE UPPER LEVEL.—It is stated that Senator Jones has leased from the Con. Virginia and California all that portion of their mines above the 1550 level. He is to account for 70 per cent of the assay value of the ores and deliver all bullion extracted from that percentage. From these proceeds the Sutro Tunnel royalty and working expenses are to be paid, and the Senator is to get $9 per ton for transportation and milling, the company is to get the balance.

Belmont District.

BELMONT MINE.—*Courier*, Nov. 24: Every thing is working satisfactorily. Supt. Fassett is pushing the work in the south tunnel vigorously, and a good ore is encountered. Operations in the north end are also progressing favorably. Work is also prosecuted in the Moore & Martin ground with flattering results. The Belmont Mining Co. have shipped 3 bars of bullion valued at $4,754.35. The company will make regular bullion shipments from this on. The following is a copy of Supt's letter of Nov. 24: "The winze from No. 1 level in Laity ground is now down 50 ft, in which the ledge is coming in solid as before. South Tunnel stopes are yielding fine ore in usual quantities. We are now opening stopes in fine bodies of ore on 200 level from main shaft, which will be producing ore in 2 or 3 days. Hoisting works in complete repair; running nicely. Chlorinations at mill from 90 to 92 per cent.

Candelaria District.

MOUNT DIABLO.—*True Fissure*, Nov. 24: The stope from lower winze No. 2 shows a little $60 ore that looks encouraging. The stope near winze No. 1, below the third level is yielding considerable low-grade ore, while that above the west drift on the same level is looking well and giving considerable $65 ore. The stope near winze No. 2, below the third level shows some 9 inches of $55 ore. A bunch of $100 ore has been struck in the east drift on the third level, which looks very promising. The intermediate between the first and second levels, is turning out $75 ore. The stope above the west drift from the Callison winze is yielding the usual amount of $60 ore. A bullion shipment amounting to $9,234.87 was made last Monday.

Esmeralda District.

SPANISH CAMP.—*Herald*, Dec. 1: Quite a town

is springing up at the Spanish Camp, about half a mile above the Mount Cory mill. Already there are four saloons in full blast. Almost every day lumber is shipped from here for building, and if the boom continues the Camp will assume gigantic proportions before snow flies. There are five families and about 100 men at the Camp. The new strike is only half a mile distant, and we understand is developing nicely, pieces of quartz being taken out of the ledge in which gold can be plainly seen with the naked eye.

GOOD PROSPECT.—*Herald*, Nov. 24: From reliable authority we learn that the samples of ore taken from Big Indian Con. mine, by the party of capitalists who recently visited and examined that property, yielded an average of $50 per ton.

Eureka District.

MINERAL HILL.—Cor. *Sentinel*, Nov. 29: The Christie mill is running very smoothly, working some 35 tons of tailings daily. About 12 tons have been shipped to the Geddes and Bertrand mill to be subjected to the leaching process, and if the result proves satisfactory, similar works but not on so large a scale will be erected here.

A NEW CAMP.—Campbell district, which is on the line between Eureka and Lander Counties, is beginning to show signs of life. The principal village is called Frisbie. During the past two weeks six private dwelling houses have been built. New prospects are being discovered every day, and things in the neighborhood look promising. The Silver Side mine is working 20 men and shipping ore to Salt Lake. The owners, however, expect to have a mill of their own erected in the camp.

The Elko *Free Press* of Nov. 23 says of the Bullion company at Frisbie named above: "They own one of the finest mining properties in Eastern Nevada, and the mine is opened to a depth of 230 ft from the surface, and shows a continuous ledge that averages 2 ft in width and assays $180 a ton. There are over 500 tons on the dump at the mine ready to be hauled to the mill. The mill has 10 stamps and all the modern improvements."

Paradise District.

BULLION MILL BURNED.—*Silver State*, Nov. 28: Yesterday Charles Kemler received a note from Paradise informing him that the Bullion of Paradise mill was burned at 2 o'clock yesterday morning. It is supposed that it caught fire from sparks from the retort, as bullion was being retorted at the time. It was a 10-stamp mill owned by the Bullion of Paradise Co., and was working ores from the Bullion mine. Until recently it had been insured for $20,000, but at present the insurance was only for half that amount.

WILLOW CREEK.—There is a genuine excitement over the discovery of what are believed to be rich placer mines at Skull Creek, a tributary of Flat Creek, some 6 or 8 miles from Willow Creek station, on the Idaho road. It appears that coarse gold has been found along the creek for 2 or 3 miles, and claims have been located nearly the whole length of the stream. Though gold had been found in the streams in the vicinity years ago, and considerable surface mining has been carried on, there never had been a prospect hole sunk on Skull Creek until very recently. F. P. Snapp, at Rebel Creek station, informs us that the most exciting reports had reached his place relative to the diggings.

OHIO.—F. P. Snapp ships to-day to Salt Lake 17 tons of ore from the Ohio mine in Rebel Creek District. The ore averages $350 to the ton in gold and silver.

Pioche District.

MENDHA.—*Record*, Nov. 24: The Mendha mine has improved greatly the last week. There is more ore in sight at present than for months. This ore is of high grade, and is galena; just what the furnace requires to work the ore from the Day mine.

BULLIONVILLE AND PANACA.—J. R. Duff and J. F. Ryan passed through Bullionville on their return from Chief district. They intend putting on a number of men this coming week, and if the mines continue to improve, will erect a mill. Condor Canyon is the only lively place in this vicinity. Mase Dixon and his partners are making money out of the tailings. The tailings assay from $30 to $50. It is very cold in the canyon, and the flume freezes at night. About 12 tons of concentrations have been shipped from Condor Canyon. In all probability the Smelting company may resume operations next June.

Pyramid District

PYRAMID MINE.—Reno *Journal*, Nov. 24: The reports from the Pyramid mine at Pyramid Lake are exceedingly encouraging. Without doubt a great and very rich body of ore is being developed. The *Appeal* says an assay made by the assayers of the U. S. Mint at Carson from ore taken from the cross cut 550 feet below the surface shows $130.85 silver and 58.46 per cent or $200 per ton copper, making the total value per ton $330.85.

ARIZONA.

GRAND CANAL QUARTZ MILL.—Phœnix *Herald*, Nov. 22: J. Ramsdell and A. W. Wiley have been putting the Grand Canal quartz mill into shape to run this winter, and have so far completed their preparations that the mill will start five stamps on next Monday. About 60 tons of ore are on hand, and more are being put on the ground rapidly from a group of mines 15 or 20 miles north of town in the Winnifred district.

ITHICA.—Captain Cherry, of the Ithica Consolidated mines on Cave Creek, came in last evening and reports fine progress. We are in possession of a sample of ore from one of this group that is exceedingly rich in black oxide of silver, and Captain Cherry informs us that there is a large body of this rock.

NOTES.—Prescott *Courier*, Nov. 24: Geo. W. Curtis tells us that the gold mine over on Lynx Creek is yielding rock which is worth $1,000 a ton. A shaft has been sunk a depth of 15 ft below the 100 ft level, and the ledge therein is larger than before. Good ore is being taken out of the Holmsite mine on Turkey Creek. Jack McDonald, of Dosoris Camp, tells us that the Blue Dick and Dosoris continue to yield an abundance of high-grade ores. Harry Ashton, who is working a silver mine near Silver Mountain, was in town yesterday having some assays made. The average of his best ore was $6,220.62. Former workers in the Chicago mine, Groom Creek district, passed by 18 inches of very rich ore, and pronounced the mine a bilk. It is this way that many rich mines have been given black eyes. Copper properties belonging to the United Verde company which a couple of years ago could not be sold for $2,000 are now worth as many millions. E. M. Clark, of the Arizona Queen company's mines, on Groom Creek, yesterday bought a ten-stamp battery.

TOMBSTONE.—*Epitaph*, Nov. 25: At the Contention mine, the erection of the pumping machinery is well nigh completed. Both large main cylinders are in place, and steam was let on for the first time yesterday. Underground every thing is progressing nicely.

RUBY.—Work has been resumed on this property, and the main shaft is now down 126 ft. No ore-body of large extent has as yet been struck.

SILVER KING.—Final *Drill*, Nov. 24: The Silver King company has now at Casa Grande the machinery for well boring, and are going to sink a 12-inch well down in the mill to increase the supply of water. Besides the Queen Creek flow, they have now a 6-inch well 150 ft deep. They will go through the volcanic rock, and probably have abundant artesian water.

Every where the mines in our district look better as work goes on. We want depth and are gradually and annually getting it.

IDAHO.

BULLION AND OPHIR.—Wood River *Times*, Nov. 21: A miner who came down from Bullion to-day stated that between 100 and 125 men were still employed in the mines of the Wood River Co. The recent discharge of some 75 men out of the Bullion mine simply means that a great deal of dead work which had to be done is completed; but the yield of the mines is from 20 to 30 tons per day, and, therefore, just as large as ever.

SAWTOOTH.—One bar of the bullion from the Vienna mill, and worth about $1,400, was shipped from this city last evening; also, 3 bars of Columbia and Beaver mill bullion. These, with the 2 bars shipped 2 or 3 days ago, make a yield, in less than a week, of 5 bars weighing 426 pounds, and worth about $7,000. The Columbia and Beaver mill is still running, and it will continue to run until "everything" freezes up. As the Vienna mill is also running, more bullion shipments may be looked for this fall.

PHILADELPHIA SMELTING WORKS.—Mathews, Pres. and Rhodes, Vice Pres. of the Philadelphia M. & S. Co., came in last Friday, to make inspection of their smelting works before shutting down for the winter. They were surprised at the mildness of the weather, which has permitted the running of 2 stacks, which turn out an average of 17 tons of bullion per day. They expected to see the works on the point of shutting down, while, on the contrary, they saw every preparation made for a prolonged, if not continuous run.

STANLEY BASIN.—*World*, Nov. 23: A new order of things is arranged for the old-time placer camp of Stanley Basin. During the past summer a gang of Bellevue boys located several placer claims. The older-timers there, who have worked in the basin for 5 or 6 years, proposed to sell out to the newcomers. The result is that a Nebraska Co. was organized and the old-timers were brought out. The new company has surveyed a ditch and partially completed it. Heretofore only snow water, early in the summer months could be utilized. The ditch is to be 15 miles long, and will supply 5,000 inches of water the year round. The company now owns all but 20 acres in the basin—nearly 300 acres in all. Every body knows of Stanley Basin; how those men with 100 ft flumes and a few boxes have cleaned up, in the 20 or 60 days' run they have had in the years past, from $1,000 to $6,000, and how they, with a rocker, have made from $5 to $100 per day, many a time and oft.

BANNER.—Joe Robbins and 12 others will work in the Banner mine this winter. A shaft will be sunk to the depth of 100 ft from the face of the lower tunnel in the Banner mine, which tapped the ledge at the depth of about 300 ft. Bradford, McLain, Austin and Gallager, who have a contract from the Elmira Co., for running east and west on the Wolverine ledge, at Banner, will work all winter.

MIDNIGHT.—Ketchum *Keystone*, Nov. 24: John Campbell, of Hailey, has been representing the Midnight claim, on Warm Spring Creek, through J. G. Lindsey. The latter came to Ketchum Thursday, and reports the claim in a beautiful condition. The ore bodies in the old works are good, showing a 2 ft vein, containing considerable quantities of galena, assaying from 400 to 600 ounces.

VIENNA AND LION.—Col. Brodhead and J. B. Hastings, returned this week from Vienna, where they had been to fix the location of the new tunnel of the Vienna mine in connection with the compromise line between the Vienna and Lion. They report wonderful bodies of rich ore exposed by the stopes and drift of the mine, and add that the developments being made in the Vienna enhance the value of the Lion.

ATLANTA.—Ketchum *Keystone*, Nov. 21: The Buffalo mill has closed down for the winter. The Buffalo mine will work but a few men, by contract, during the winter. The construction of the new Tahoma mill has been suspended. It is reported that the cause is discord in the company. The Last Chance mill and mines have closed operations entirely for the winter. The Monarch employs a winter crew of 14 men. The Leonora mill started up Monday on ores from the Leonora mine, which has been in operation for some time.

COEUR D'ALENE.—The Idaho *World* of Nov. 23 copies the following from the Palouse City *Boomerang*: "Mr. Jesse Bishop, an old miner, has just returned from the new diggings. He has been there for several months, and has had an ample opportunity to investigate the many reports, and from actual knowledge can give reliable information concerning the camp. He says that there is no doubt but the rich ground extends over a large extent of country, the richest not yet discovered. All the creeks and side gulches give good prospects. Quartz ledges have been struck that are lousy with gold."

But little prospecting for quartz has been done owing to snow, which is eighteen inches deep on the hills. The claim owners have held a meeting, and passed a law allowing claimants to be absent until the first of next June. The camp is filling up with roughs from the railroad, who express a determination to make claim jumping a specialty. They say that the 20-acre racket "must go." Mr. Bishop says it is his opinion that every claim in the camp will be jumped before spring. It is probable that injunction suits, forcible entry and detainer squabbles and post mortem examinations will occupy the time of the miners next summer.

THE NEW MINES.—The following is from the Virginia *Enterprise*: Bozeman, Nov. 28: There is great excitement throughout Western Montana over the rich mineral discoveries in the Coeur d'Alene Mountains. Miners and prospectors who have returned state that there has been nothing in the history of the Western States and Territories equal to the richness and volume of the newly-discovered fields. The minerals consist of silver, tellurium and free-milling gold. Over $100 per man per day is being taken out of the rim rock of the gulches, while in the gulches $25 to $40 per man per day is being panned out. The streams are in the southern part of Idaho. Eagle City is 40 miles from Heron on the Northern Pacific railway. There are now about 500 people in the camp.

ANOTHER LETTER.—The Eureka *Sentinel*, gives part of a letter from J. B. Parker, a resident of Eureka, now in Eagle City: "Several parties that have tried to approach this camp from different directions have traveled for days, making no more than 2 or 3 miles a day, and in some cases no more than a mile a day. In several instances men have abandoned their horses and equipage piece by piece, and have arrived here with only a blanket and the clothes on their back, and nearly starved. One party of men was out between here and a point on the Northern Pacific called Heron, a distance of 25 miles, for 21 days, and if it had not been that they 'discovered some fresh water claims on the north fork of the Coeur d'Alene River they probably would have perished. This is Eagle City—5 saloons, 4 stores, a butcher's booth and 2 places where some dirty individuals dish up bacon, coffee and fried dough, cooked at a camp fire, for $1 a head. This is the starter for a new camp, which I believe, from what I have seen with my own eyes, will make as great a mining camp as has ever been since the days of '49. On Eagle Creek they pan out from a color to 75 cents and $1 for 12 to 14 miles, and on Pritchard Creek the same result for 15 miles. There are a few claims that are being practically worked; these pay big, none less than $6 a day and some as high as $20 a day to the man. It is coarse gold from smaller than a pin head to the size of a pea—and numerous nuggets. I have seen 1 nugget weighing $100, and several from $15 to $50. It is "awful" pretty. Not more than 300 or 400 men will stay in here this winter, as there can be no mining done. The snow will be 5 or 6 ft deep. It will be very expensive every way living here during the winter. Companies of miners leave men enough to hold their ground and the rest skip out for civilization. I am going to make a "settle-down" stake here. I am certain that it is going to be a wonderful camp.

MONTANA.

ALICE.—*Inter-Mountain*, Nov. 24: The 80 stamps in the 2 mills of the Alice Co. continue to make musie. The ore comes mainly from the Magna Charta, but recent explorations in the Alice have resulted in largely increasing the output, and it now produces about one-third of the ore the company is treating. The furnaces are doing good work, the chlorinations hugging 90 per cent with gratifying regularity.

LEXINGTON.—The Lexington is maintaining its magnificent record. It has produced nearly $1,200,000 since the first of January last, figuring the silver in the bullion at the value of 1.05. The new mill is running on ore from the Lexington mainly, but treats daily about 10 tons of ore from the Allie Brown, also owned by the Lexington. The old mill is working principally on tailings, of which there are 15,000 tons available for reduction.

MOUNTAIN VIEW.—There can no longer be a doubt that the Mountain View and Anaconda ledges are identical. The best mining men in the district, after a personal inspection of the ground, have expressed this conviction, and renewed interest is felt in the present explorations. The face of the 300 ft south cross-cut is now 230 ft from the shaft and has penetrated the mammoth ledge for a distance of 80 ft without yet encountering the hanging wall. The character of the ledge matter closely resembles that of the Anaconda at the corresponding depth. The ore occurs in patches and streaks which increase in frequency as the hanging wall is approached.

PARROT.—The Parrot shaft has attained a depth of 300 ft. A large station is completed. The north vein has been cross-cut a distance of 40 ft from the shaft. The vein is 10 to 15 ft thick, carrying a heavy percentage of copper, and frequently coated with leaf silver.

PHILIPSBURG.—Cor. Butte *Miner*, Nov. 24: The crushing of 1,500 tons of ore, taken as it came from the stopes, yielded the Granite Co. 8 tons of silver, .999 fine. As thousands and thousands of tons yet remain, it would be an excellent idea for those who do not favor the demonetization of silver coin, to buy in this property. The president of the company wires me that it can be purchased for $200,000,000. The Granite Mountain alone has shipped bullion valued at $200,000 during the past 2 months, the last shipment 10 days ago amounting to $125,000. The principal work on the mine has been done during the past 2 years. A large amount of ore is being worked at the Algonquin mill which is owned by the Granite Mountain Co., and the battery samples are running from 220 to 225 ounces per ton. The mill crushes 20 tons per day turning out $4,000 in refined bullion every 24 hours. The company early next year will erect a silver mill of 60-stamps, and work their property on an extensive scale.

FISH CREEK PLACERS.—During the past fall a number of men have been at work on Fish Creek, where Highland comes out. Yesterday it was learned that the labors of these men had been rewarded by finding placer diggings which pay handsomely. The location is at the southeast entrance to Fish Creek Canyon, 16 miles from Butte. Old miners who have been in report they obtained favorable prospects 20 years ago.

NEW MEXICO.

STEEPLE ROCK.—Southwest *Sentinel*, Nov. 24: The Norman mine, in Steeple Rock district, is said to be in a fair way to rival the great Carlisle mine, of the same district. The shaft is down to a depth of 80 ft and has been sunk all the way in ore. Only a few months ago the Norman went begging on the market; it was offered at the low price of $3,000, but no buyer could be found, until Mr. Farrish, Supt. of the Carlisle, had his attention drawn to it. He at once secured the mine, began development work, and now it could not be bought for less than $150,000.

VIOLA.—The Viola mill at Pyramid was started up Monday week and has been running steadily ever since. If the scarcity of water does not prevent, the mill will be kept in constant motion, as there is plenty of ore in sight in the mines there to keep it running for years to come.

LAKE VALLEY.—Lake Valley never had a brighter future than at present. With the mines opened up so as to produce 800 or 900 tons of high-grade, shipping ore per month, and a mill capacity of 40 or 50 tons per day to work all the ore running from 10 to 35 ounces she will soon regain all which was accorded her during the days of the famous Bridal Chamber.

OLD MAN.—Silver City *Enterprise*, Nov. 23: The anticipated sale of the Old Man mine to Jerome B. Chaffee, was not consummated. Chaffee and party left on Sunday for Denver, carrying with them favorable impressions of the mine. As we understand it, the offer of Mr. Chaffee was $100,000 for the mine and mill, under a working bond for 90 days, agreeing to expend $15,000 in developing the mine, leaving the high-grade ore on the dump and treating the low-grade as fast as extracted. Should the mine at the expiration of 90 days prove satisfactory the money was to have been paid, but proving the mine did not meet the expectations of the holders of the bond then they would withdraw, leaving the ore and developments in the hands of the company. This offer, which was made in writing, was rejected by Peter June, one of the locators of the property, and holder at present, of 20,000 shares of the stock. Other stockholders refused to allow their interests to go in at that figure and the sale was declared off.

OREGON.

NOTES.—Baker City *Tribune*, Nov. 20: A tunnel of 40 ft on the Egan shows a 12 ft vein, 2 ft of which is very rich in native copper; the vein assays 60 ounces silver per ton. The shaft on the Black Maria is down 100 ft, from which depth a cross-cut is being run to the foot wall. The cut is in 12 ft, through good paying ore the entire distance. The shaft on the Daniel Boone is sunk 50 ft, from which depth a level has been run 25 ft, showing from 1 to 4 ft of high-grade silver, assaying into the hundreds. A cross-cut, 80 ft deep from the surface, on the Black Hawk shows a ledge 40 ft wide, principally chloride of silver, the assays of which vary from 42 to 212 ounces per ton. While doing the assessment work on the Gray Eagle, adjoining the Lucky Boy on the northwest, John Dennet has exposed a 12 ft vein of chloride silver, and has not yet reached the hanging wall. A drift of 50 ft on the Kit Carson shows a 4 ft vein, ore similar to the Black Maria. Messrs. Peck & Eastabrook, owners of this mine, also own the Lucky Boy and Jay Gould mines. The latter shows a 10 ft vein, assaying high in copper and silver.

CALUMET.—Baker City *Tribune*, Nov. 16: Sol. Center, Supt. of the Calumet mines, in Union County, Oregon, has returned home after a hard summer's work developing this property. The mine is of copper, carrying much gold and silver. The ledge is a strong body of solid quartz, and a drift run across it 52 ft has not crossed the ledge. Work is suspended for the winter, owing to the snow. Ordinary assays of the ore yield $50 per ton in gold and silver, and from 10 to 60 per cent in copper. Picked specimens go as high as $250 per ton. The mine is so advantageously situated that the ore can literally be quarried out, and when opened a thousand stamp mill can be kept running day and night with the greatest ease. As soon as spring opens work will be commenced in good earnest and a 15-stamp mill will be erected, with rotary furnace and amalgamator. The ore is extremely free-milling and can be worked at an expense of $1 per ton, and with a large 200 ton stamp mill can be reduced at 40 cents per ton.

UTAH.

NOTES.—Park City *Record*, Nov. 24: There promises to be greater activity in mining matters during the coming year than for some time. Bob Pyper and James Baker have started a tunnel on the west side of the Empire Canyon, near the reservoir. The Sampson is putting in some splendid work on the mine and it is looking well in all the workings. Ore shipments will be regular this winter. The air compressor at the Daly shaft is being placed in position. Forty men are now employed. Mr. Pierson of the Pioneer, who was in the city yesterday, reports having struck the vein. He is as sanguine as ever of having a big mine. The bad weather has interrupted ore shipments this week, but as soon as sleds can take the place of wagons all along the line, shipments will increase. The boarding house of the Barry Con. is completed and work on the incline shaft is being prosecuted with vigor. The shaft was down 10 ft yesterday and is being timbered systematically. The Ontario is employing 300 miners and is in better condition than ever. The new developments in the west drift are a surprise to the management. The Apex shipped 30 tons of low-grade ore to the Mackintosh sampler this week, which went 20 ounces silver and 25 per cent lead. It is reported that there are 1,000 tons of this class of ore in the mine. The Crescent Co. have 70 men in their employ, and will probably increase the force. Since Colonel Hollister's big report on the Crescent 700 ft of work has been done and more ore is exposed than ever.

ONTARIO.—Southern Utah *Times*, Nov. 24: It is asserted by mining men who have been studying this camp, that the time will soon come when the Ontario vein will be producing for a distance along its length of 2 miles. In view of developments at Daly's works it would certainly seem as if the prediction would be verified.

INDIAN DISTRICT.—The work at Indian District has ceased for the winter. There has been a few tons of ore that will work $150 per ton, sacked, and it will be brought to Bristol. About 100 bags of concentrations have been shipped to the East from Bullionville to be experimented upon.

For Mining Shareholders' Directory, Stock Reports, etc, see page 372.

Collecting Flue Dust—No. 3.

The cost of constructing the flue was large in certain parts of it, on account of the difficulty of carrying the building materials up to the high ground where the flue was built. On comparing the cost of each part of the flue, it appears that the flat portion of Section IV., Fig. 9, as well as the large condensing chamber buildings, X and Y, Fig. 12, were the cheapest. It must be noticed, however, that two of the flues have nothing to do with the saving of the fine dust. One of these is the one which goes to the old chimney at Station 22, and carries the gases from the stalls used for roasting the lead matte. These stalls are used only a short time during the year. The other is the one used for the ventilation of the shaft-furnace house.

Around each one of the five Pilz furnaces, one meter from its outside and one and a half meters above the furnace-hearth, a sheet-iron cylinder two millimeters thick is placed. It is open below but closed above, and is joined to a pipe fifty centimeters in diameter. Each one of the pipes for the five furnaces passes through the charging-floor. They meet together outside of the building in a flue, which leads to the chimney L at Station 13, which chimney is 18 meters high and 43.5 meters above the charging floor. This furnishes sufficient draft to carry off the fumes.

In making the comparison of the material collected on every 100 square meters of wall surface and that of every 100 cubic meters of contents, the first four campaigns are particularly noticeable, as in these the relation of the square meter to the cubic meter, that is, to the mean section of the flue, has frequently changed. When the flues were first built they were made, as they usually are elsewhere narrow. Those more recently constructed, which have served partly to replace defective ones and partly for the increased production of the works, are made much larger than they formerly were. The mean section of the entire flue has in this way become constantly larger, so that when the old flues were finally destroyed the large section was taken as the normal one for the new ones.

Making a comparison of the quantity of lead collected per square meter of wall surface in the first four campaigns, a table shows that the quantities were nearly alike and varied regularly in very small quantities, while, on the contrary, the quantity collected per cubic meter during the enlargement of the flue was considerably less. From this the conclusion may be drawn that the material collected under such circumstances is proportional to the extent of wall surface, and that the cubical contents of the flue, including the chambers, has very little influence when the quantity of wall surface has undergone any change. These conclusions are fully sustained by the experiments formerly made with the two large condensing chambers X and Y, the increase of the cubical contents of the flue, owing to their addition, having been almost without influence.

The amount of dust collected on the bottom of the flue of the condensing chambers was always much higher on the sides than in the middle, owing to the fact that after a certain quantity is caught on the walls it falls to the bottom of the flue from its own weight, and is heaped up there. In the last two campaigns a very much more favorable result was obtained than in the four previous ones, owing to the fact that much greater attention was paid to the regulation of the draft by the damper in the chimney, which was kept closed, so that the furnaces had only just the necessary draft. The material contained in the gases had thus much more time to settle on the sides, and that which had already settled either there or on the roof was not unnecessarily detached from it. The proportional quantity of dust collected upon a square meter of wall surface under similar circumstances is necessarily smaller the greater the section of the flue, so that by increasing the wall surface from 10,710 square meters as in the fifth campaign to 22,650 square meters as in the sixth, to 23,791.14 square meters as in the seventh, and to 34,291.98 square meters as in the eighth campaign, the decrease of the material collected per square meter of surface is easily understood. The conclusion was therefore drawn, after the results of each period were known, that the wall surface of the flue might safely be enlarged, which was accordingly done. * * * * * * *

Up to this time reference has only been made to the lead contained in the dust. The other components, however, are of interest, especially the silver, as its value is always of some importance. The last time the flue was cleaned, the dust, according to an assay of 1,000 kilos., contained 51.86 grams of silver, so that the total

Amount of Silver Contained in the Dust

Was 48 kilos. If, however, the quantity of silver which is contained in the lead obtained from the roasted and smelted dust is taken as a starting point, the silver contained in 1,000 kilos. would be 72.11 grams, or, altogether, 67 kilos., which quantity is, therefore, the normal from which all calculations must be made. With regard to the repartition of the silver in each section, it is the greatest nearest the furnace, and then diminishes, at first rapidly, but after that very slowly. In the last campaign the amount of silver contained in the dust, according to an assay of 1,000 kilos., was:

At Station	I.	150 grams.
"	II.	50 "
"	III. Just behind the roasting furnaces	75 "
"	IV.	00 "
"	V.	45 "

From this point the silver diminishes gradually till at the end of the flue it is only 30 grams.

It appears very clear from these assays that in the beginning the dust contains a considerable quantity of particles mechanically carried off, which, on account of their weight, can only be transported a certain distance. When the draft is stronger they will be carried further, and its influence will be shown in the increase of these small particles of ore. This explains why it is that in former years, when there was no damper in the chimney, there was nearly half as much more silver in the flue dust as now. From the fact that the ratio of lead to silver in the flue dust is different from that in the ore, it is certain that in the discussion of this whole question the condensation of the volatilized material is by far the most essential consideration.

The dust contains between three and five per cent of zinc. In general it can be said that it is greater in the beginning than at the end of the flue. The difference, however, is not very great. The antimony contained is between .21 per cent and .40 per cent. It decreases very gradually in the length of the flue. The dust which is deposited on the bottom of the flue often contains 10 per cent more lead than that which is deposited on the arch. This observation has been confirmed every time the flue has been cleaned. The analyses of two samples of dust which was deposited by Station 46, more than 1,500 meters from the beginning of the flue, is given below:

ANALYSES.

	I.	II.
Lead	60.48 per cent	67.04 per cent
Zinc	3.17 " "	4.22 " "
Silver	.003 " "	.003 " "
Sulphuric acid	14.78 " "	14.07 " "
Sulphur	6.22 " "	5.42 " "
Oxide of iron) Alumina)	2.12 " "	1.00 " "
Carbon	8.00 " "	5.80 " "
Antimony	.42 " "	.31 " "
Arsenic	.24 " "	.10 " "
Copper	trace.	trace.
Lime	1.15 " "	.61 " "
Total	96 583 " "	98.633 " "

Assay No. I was taken from the arch, and No. II from the floor directly under it. The difference between these two will not be apparent when large masses are considered, for the dust increases in depth on the floor, because that which collects on the roof after a time gets heavy and falls to the ground on the top of that collected there, so that the results obtained by the analysis of a sample taken from a large quantity will be a mean of the two, and will not represent either the one or the other.

From these facts it is plain that the most important consideration is not that of collecting the particles of ore which are mechanically carried off, but of condensing and collecting those which have been volatilized and sublimed. Two separate means can be used for condensation, and these are the proper application of wall surface, and some method of cooling that surface. There is a limit to the possible cooling of the wall surface, and in any case this method can only be useful up to the point where the gases are reduced approximatively to the temperature of the outer air; beyond this point artificial means of producing the draft would have to be used. How far the flue can be cooled will depend upon the material used for the construction of the walls, and whether the flue itself is more or less buried in the ground.

The Limit of Methods of Construction

Lies between sheet-iron flues suspended in the air or laid on the surface of the ground and masonry flues buried entirely in the earth. The lowest point to which the gases can be cooled will be that which will give the necessary draft for the proper conduct of the furnace. The chimney must, therefore, be built either upon a high elevation or must itself be sufficiently high to produce the draft, or the gases at the foot of the chimney must have their velocity increased, either by bringing the gases at that point up to the requisite temperature or by causing the air to move by power. In the works at Ems little can be gained by the further cooling of the gases, as these at the foot of the chimney at Station 47 on the top of the hill have only a temperature of 64 degrees C., so that to increase the quantity of dust collected more surface must be provided. Since the intercalation of the last two chambers, which, with their necessary additions, have a surface of 8,815 square meters, it has been found necessary to open the damper of the chimney to 45 degrees. Formerly it could only be opened with safety to 27 degrees. There is little or nothing to be done further to increase the draft except to open the damper entirely, or to increase the hight of the chimney. As, however, all that is necessary now is to increase the wall surface, this can be done more quickly and cheaply by placing sheet-iron plates in the flues already constructed. This system was tried in Section XVI. from August 28th to December 24th, 1881. Four rows of sheet iron, No. 22, 100 meters long and one wide were hung in the flue. Taken together they represented 800 square meters surface; the collective wall surface of this division was, therefore, increased from 933 to 1,733 square meters. The quantity of lead contained in the ore and in the dust at this time was 3,028,565 kilograms. In the previous campaign, of the 6,748,816 kilograms of lead in the ore and dust which was treated, there were collected in Section XVI. 23,713 kilograms of dust. It was, therefore, calculated that with the increased wall surface from this arrangement of thin plates, 19,766 kilos. would be collected in this. The amount actually collected was 18,800 kilos., which was somewhat higher in lead than that collected in the previous experiment. The results of these experiments were so satisfactory that the number of plates was increased to six, as shown in Fig. 16. The quantity thus collected was so very large that in some of the sections of the main flue, notably in Figs. 11, 12 and 17, vertical plates 10 millimeters apart were introduced. As this method of construction costs only about one-tenth as much as the same amount of wall surface made with masonry, and allows of regaining more flue dust than the construction of long flues and condensing chambers without it, a patent for the improvement has been taken out in the name of the Ems Lead and Silver Works, which has proved not only useful for metallurgical but also for chemical and other manufacturing works where metals are likely to be volatilized. It is also probable that its use will be found advantageous in the manufacture of zinc white, the treatment of ores of mercury and other volatile substances, where the main object of the treatment is the condensation of the volatilized metals.

Nickel and Sulphur.

Nickel unites with sulphur in three proportions, yielding thereby a di-nickelous sulphide (Ni_2S), a protosulphide or nickelous sulphide (NiS), and nickelic disulphide (NiS_2).

Di-nickelous sulphide (Ni_2S) forms a pale yellow, brittle, magnetic, and readily fusible body, produced when the sulphate of nickel is reduced in a current of hydrogen gas.

The *protosulphide of nickel* or *nickelous sulphide* (NiS) constitutes the most important combination of these elements, occurring native as nickel pyrites or capillary pyrites described under the ores of nickel. It also results when sulphur is fused with finely-divided nickel, likewise when sulphur acts upon oxides of nickel heated to redness, or when nickelous oxide is ignited and reduced by a current of sulphuretted hydrogen. An impure variety also results upon the reduction of nickelous sulphate by carbon. The direct union of nickel and sulphur is attended with the production of light, the combination taking place with considerable violence, and at a temperature below the melting point of sulphur. This sulphide is a brass yellow body, with a metallic lustre; it is decomposed by ignition in air or when heated in chlorine gas, but not by hydrogen at a red heat; and it is not so readily fusible as the sulphide first described.

A *hydrated* nickelous sulphide is precipitated as a dark brown or black precipitate upon the addition of ammonic sulphide to a neutral solution of any salt of nickel; but it oxidizes by exposure to the atmosphere, with the production of a soluble sulphate, and it is also sparingly soluble in an excess of ammonic sulphide. If heated out of contact with the air the hydrated sulphide parts with its water and yields the anhydrous sulphide.

Nickelic disulphide (NiS_2) forms a steel-grey powder when a mixture of nickelous carbonate, potassic carbonate, and sulphur is heated to dull redness. It is decomposed by chlorine with the production of the chlorides of nickel and sulphur.

The Determination of Copper in Steel

The following paper was read by Magnus Thorlius before the American Institute of Mining Engineers: The following is a very rapid method of determining copper in steel. I have found it to give results very closely agreeing with those obtained by galvanic precipitation of the copper.

Five grams of steel are dissolved in a mixture of 100 c. c. of water and 100 c. c. of sulphuric acid. When all is dissolved, add 2 c. c. of a concentrated solution of hyposulphite of soda, and stir well. After 15 minutes' boiling, all the copper is down as black sub-sulphite of copper (Cu_2S) and the solution regains its greenish color. Filter rapidly, wash a few times with hot water, pierce the filter, and wash the precipitate back into the beaker in which it was made.

Dissolve in a little aqua regia and evaporate with about 2 c. c. of sulphuric acid, until white fumes appear. Dilute with water, heat to near boiling, and add excess of ammonia (sp. gr. 96). Allow to settle in a warm place filter and wash with hot water containing some ammonia. From the filtrate evaporate the excess of ammonia, add a little dilute sulphuric acid till it is slightly acid, and precipitate the copper as before, with a few drops of hyposulphite of soda. Filter on a washed filter-paper, wash with hot water, place the wet filter in a weighed porcelain crucible, ignite and weigh as oxide of copper (CuO).

When an ordinary Bunsen burner is used, care should be taken not to let the crucible come into contact with the inner cone of the flame.

Recent Contributions to the California State Mining Bureau.

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[CATALOGUE.]

5065. Silver Ore—Advance mine, Monitor district, Alpine county, Cal. Geo. F. Beardsley.
5066. Gold Quartz—Oakland mine, Grass Valley, Nevada county, Cal. Oakland Gold Mining Co.
5067. Gold Quartz—Padre mine, Carga Muchacho district, San Diego county, Cal. Seupham & Childs.
5068. Gold Quartz—Madre mine, Carga Muchacho district, San Diego county, Cal. Seupham & Childs.
5069. Cement with Gold—Nice & West mine, Nevada county, Cal.
5070. Gold Quartz—Akin or Virginia mine, near Coulterville, Mariposa county, Cal.
5071. Ore containing Free Gold—Juniper mine, Hayden Hill, Lassen county, Cal. Hon. John Daggett.
5072. Gold Quartz—Poule mine, Clipper Gap, Placer county, Cal. Henry C. Hyde.
5073. Silver-Gold Ore—Julia mine, Lake district, Mono county, Cal.
5074. Pyrolusite—Stonewall mine, Tombstone district, Pima county, Arizona. Said to be argentiferous. J. G. Manning.
5075. Silver Ore—Ingersol Consolidated mine, Tombstone district, Pima county, Arizona. J. G. Manning.
5076. Silver Ore—Phœnix mine, Tombstone district, Pima county, Arizona. J. G. Manning.
5077. Silver Ore—Way-Up mine, Tombstone district, Pima county, Arizona. (See Nos. 2015-2485.) J. G. Manning.
5078. Quartz Breccia, Picket Post, Pinal county, Arizona.
5079. Volcanic Rock, which crops out in immense masses near Picket Post, Pinal county, Arizona.
5080. Sedimentary Sandstone—Seal Rock, off Point St. George, northwest boundary of Cal. Col. R. S. Williamson, U. S. Engineers.
5081. Sandstone—West side of the Great Eastern Quicksilver mine, Sonoma county, Cal. Supposed to be the foot-wall. (See No. 2744.)
5082. Footwall of the Great Eastern Quicksilver Mine—Sonoma county, Cal. Two hundred and twenty foot level. (See No. 5081.)
5083. Limestone—Near Auburn, Placer county, Cal. Geo. W. Kimble.
5084. Cellular Lava with Zeolite—Solidad Canyon, Los Angeles county, Cal. G. D. Keeney.
5085. Rock Specimen (undetermined)—Corner Pine and Powell streets, San Francisco, Cal.
5086. Gneiss—Said to be found in San Francisco in places, but this needs confirmation. William Robinson.
5087. Chalcedonic Quartz (Banded)—Santa Rita Mountains, Pinal county, Arizona. J. G. Manning.
5088. White Dolomite—Tujunga Canyon, seven miles from San Fernando, Sierra Gabriel Monatahs, Los Angeles county, Cal. Valuable for building and manufacturing purposes.
5089. Cement Rock, impure Carbonate of Lime (?)—Hill west of road to Weston's Canyon, San Gregorio Pass, San Bernardino county, Cal. Welwood Murray.
5090. Clay, overlying Cement Rock No. 5089—San Gregorio Pass, San Bernardino county, Cal. Welwood Murray.
5091. Rock Specimen—Woodford's, Alpine county, Cal. Edward Barnes.
5092. Rock Specimen, Country Rock—Silver King mine, Pinal county, Arizona.
5093. Rock Specimen, fine Sedimentary—Town of Los Angeles, Cal.
5094. Porphyry, in 10 varieties—Florence, Pinal county, Arizona. From the bed of the Gila River.
5095. Volcanic Rocks, 13 varieties—Bed of the Gila River, near Florence, Pinal county, Arizona.
5096. Red Jaspery Rock—Bed of the Gila River, near Florence, Pinal county, Arizona.
5097. Crystalline Rocks, in 3 varieties—Bed of the Gila River, near Florence, Pinal county, Arizona.
5098. Building Stone—Used in Portland, Oregon.
5099. Silver Ore—Sultana mine, 40 miles from Salem, Linn county, Oregon.
5100. Silver Ore—Monumental mine, Oregon.
5101. Silver Ore—Sheridan mine, Grant county Oregon.

Gallatin County, Montana.

Since the ratification of the treaty made with the Crow Indians, that part of their reservation which included the Clark's Fork mines is now comprised within the limits of this county.

While the first operations inaugurated in that locality were not in any degree satisfactory, later developments have proved that good grades of ore can be secured in abundance. The first smelting done was principally from the great bowlders of galena found upon the surface, and which happened to carry very little silver. As the lodes were opened and ores extracted from below the surface, it was found that many were exceptionally rich, and the fact is now established beyond question that the New World district will develop into importance as a mineral-producing region in the history of Montana.

The smelter built by the Eastern Montana Mining and Smelting Company has been renovated, and during the latter part of the season of 1882 did some successful work in reducing the ores taken from the lodes which produce those of good grade.

Among the best known and most promising lodes of that region are the Great Republic and the Black Warrior, the former being the widest and most regular, but the latter carrying the highest grade of product. The requisite fluxes for the smelting of ores are found there in abundance, and the percentage of lead desirable can be found in almost any of the ores extracted from the mines to the depth reached in the present stage of development.

The placers found in Emigrant have doubtless produced more gold than any other gulches worked in this county. Of late years the amount realized has not been large, but there is no falling off in the returns. Three parties worked in that gulch during the last season, and from the most reliable information at command the aggregate clean-ups will not be less than $12,000. Some have estimated the amount realized from that locality during 1882 at not less than $30,000.

Bear and Crevice gulches have also been worked to a limited extent, and Brown's arastra has continued to add its quota of gold to the general yield, from ores supplied by the narrow but rich gold lodes of Bear and Crevice mountains, where there are about fifty recorded locations.

Placer mining has been done on the Bowlder, which is now the boundary of the Indian reservation, and many quartz locations have also been made; but until there are better facilities at command for the successful treatment of the ore produced, the hullion yield of Gallatin County will remain insignificant in comparison with the acknowledged resources which it has developed.

Without estimating the lead value in the bullion, the yield of the county in gold and silver during 1882 was not less than $30,000.

Mica.

Occurrences.

Muscovite mica, varying greatly in quality and the size of sheets, occurs in nearly all of the granitic, gneissoid, and schistose areas of the country. At present North Carolina takes the lead in point of production. In that State, since 1868, mica has been mined in many places, and has been obtained in plates sometimes over 3 feet in diameter. Numerous localities exist in Macon, Jackson, Haywood, Buncombe, Ashe, McDowell, Yancey, Alexander, Cleveland, and other counties. Merchantable mica is also found in many other of the South Atlantic States. A considerable amount is mined in Maine and New Hampshire. A recent discovery, said to be important, is announced to have been made in Salisbury township, Pennsylvania. At South Mountain, in the same State, a new mine has been opened, which is said to have produced pieces of good mica weighing from 19 to 27 pounds, some of which could be split 160 times to the inch.

Mica is found in numerous States and Territories contiguous to the Rocky Mountains. In a few localities it occurs in medium sized plates of good quality; but in this region only the mines of Deadwood, Dakota, and one mine near Las Vegas, New Mexico, have shipped any mica to market. The McMaken mine, near Deadwood, had sold up to May 140,000 pounds of merchantable mica, and the Sundog, Black Hills, and other mines have shipped small quantities. The mica from these mines is of excellent quality, and plates are sometimes produced 12x18 inches in size. The main ledge is said to be 14 feet wide, and to consist of a central mass of feldspar and "porphyry," with a casing of mica, which varies in width from 3 to 4 feet, on each side. The country rock is granite. These mines have hitherto been developed only by open cuts, and until recently have never been steadily worked.

In Wyoming mica occurs occasionally in plates 4x6 inches in size, and of good quality; but the supply is extremely limited. In Colorado good plates of mica have been found in Bowlder, Jefferson, and Fremont counties, but only in very small quantities. In New Mexico, near Las Vegas, it is said to occur in considerable amount, some of the plates being 8x14 inches; but, although found in large quantity, only a few small pockets produce sheets of marketable size. One small shipment has been made.

Mica of excellent quality has also been discovered on the Payette River and in other localities in Idaho. Local excitements about mica claims are frequent in Nevada; but thus far there has been no actual production. A number of claims were located in the southern portion of Nye County during the past winter.

Deposits of mica are found in nearly every county in California, and in many of the mining districts, and at various other points on the Pacific Coast. As a general thing, however, it is of somewhat inferior quality, though some quite clear and in large sheets has been discovered. No regular mica mining is done in this portion of the country, though several deposits have been opened with the hope that systematic developments would ultimately be made. Still, the local market is quite limited, and there has been no encouragement for miners to open the deposits they have found.

Prospectors in search for gold and silver in Alaska report that deposits of mica are numerous in that Territory.

The total production in 1882 is estimated by Messrs. Munson, Rolls & Co. at 75,000 pounds of sheet mica, with a total value of $250,000, which would give an average of $3.33 per pound. There is little doubt that the product will be largely augmented by the recent important discoveries, especially those in the Black Hills region.

The clear, transparent, and tough mica plates are used in various ways, the principal utilization being for stove and furnace doors. A small amount of specially fine mica is used for compass plates. Mica generally occurs in plumose or scaly form, rendering it valueless for its best known uses. These varieties are pulverized and used as an absorbent in one variety of nitroglycerine explosives, and enter also into a patented lubricating composition for axles and bearings. Ground mica is also employed for various ornamental purposes. Scrap mica and trimmings from the better kinds are pulverized and utilized in the same way as the inferior varieties. The demand for ground mica, however, is comparatively small, and the supply of mineral suitable for the purpose to which ground mica is applied is abundant.

The price ranges from 25 cents to $5 per pound, according to the size of sheets and quality. Some exceptionally large and clear sheets from North Carolina have been sold at $10 per pound; but mica of this grade rarely comes on the market.—*Mineral Resources of U. S., by Albert Williams, Jr.*

NEW HOOP-MAKING MACHINE.—A Bostonian has invented a hoop-making machine which, it is said, makes from 20,000 to 30,000 half-round hoops a day, cutting two, three or four from a pole, as occasion requires. One of the results of the introduction of this new machine will be the utilization of ironwood saplings for hoops. This tough and almost indestructible wood, which resists the tools of the cooper, is said to be handled without difficulty by the Boston hoop-making machine.

USEFUL INFORMATION.

Choice of Lubricating Oils.

The quality of the lubricant will be governed to a certain extent by the character of the machinery to which it is applied, that is, whether upon light or heavy bearings; whether these are given high or low velocities, etc.; so that an oil that might serve admirably under certain circumstances would not necessarily be the best when these conditions were very different. The weight of testimony, however, as to the relative merits of the animal and vegetable oils in comparison with the mineral oils appears to incline in favor of the latter on the score of general applicability.

For example, Spon is authority for the statement that the best oil is that which has the greatest adhesion to metallic surfaces and the least adhesion in its own particles. In this respect, he asserts, fine mineral oils stand first; sperm oil, second; neat's foot oil, third; and lard oil, fourth. Consequently, he concludes, the finest mineral oils are the best for light bearings and high velocities. The same authority adds that mineral oils alone are not suited to heavy machinery, on account of their want of body, but well purified animal oils are applicable to the heaviest machinery.

Thurston, who is eminent in this specialty, is unqualifiedly favorable to the mineral oils for all species of service. On the score of their adaptability for heavy bearings, he makes the statement that pure natural West Virginia oil, 29 deg. Beaume, is suitable for all kinds of heavy machinery. It is preferred by many consumers to sperm or lard oils. And again, oil of heavy body (that is, mineral oil) and a fire test of 330 deg. to 350 deg. Fah. is often used for railroad-car axles, heavy machinery, locomotives, or for any purpose where great heat is to be provided against, and for bearings where heavy weight is sustained. It has excellent wearing qualities, and will lubricate and keep car journals and heavy bearings cool when oils of a lower fire test would volatilize. For factory use, high speed, with both heavy and light bearings, and wherever the lubricator is fed to bearings by capillary attraction, it is (when properly refined) a good lubricant.

The following general summary of the subject of the qualities and comparative merits of these two classes of lubricants, from the same authority, will be found to have interest. It is as follows: All vegetable and animal oils are compounds of glycerine with fatty acid. When they become old decomposition takes place, and the acid is set free, by which action, as is commonly said, the oils become rancid. This rancid oil will attack and injure the machinery. Again, all animal oils contain more or less gummy matter, which accumulates when exposed to the action of the atmosphere, and will consequently retard the motion of the machinery. Mineral oil does not absorb oxygen, whether alone or in contact with cotton wool, and can not therefore take fire spontaneously, as animal and vegetable oils do. The consumption of petroleum, or mineral lubricating oils, is largely increasing; they are used on all kinds of machinery; they are the safest and cheapest lubricators, and superior to animal and vegetable oils and greases; they are safer on account of their non-oxidizing properties and their high fire test and the heat they will resist before vaporizing; they are cheaper in price and more economical, saving both machery and fuel; they are more reliable, because they are entirely pure and always uniform in quality; they last longer and work cleaner; they are perfectly free from acids and every impurity; they neither gum, stain machinery nor manufacturers' products. As this inquirer will perceive from a reading of the above, a more emphatic indorsement of the mineral oils as lubricants would scarcely be possible.—*Manufacturer and Builder.*

THE REBACKING OF PAINTINGS.—A Washington letter describes the *modus operandi* of taking off the old canvas of some of the great paintings hanging in the Capitol rotunda and substituting new. The picture is laid upon its back on the floor, and a sufficient thickness of cartridge paper gummed on the face to prevent injury. It is then turned over and the old canvas scoured off with pumice stone. This is a tedious operation requiring much care. The new canvas is stretched and covered with a thick, adhesive substance, which penetrates every part. The back of the painting is then covered with a more fluid mixture, when the canvas is laid upon it. The whole is turned over, the face of the picture coming uppermost. Small flat-irons, heated to a temperature that will hasten the drying of the glues without injuring the paint, are passed carefully over the surface, the cartridge paper preventing harm. Towards the close heavier irons are used. The paper is then moistened and removed, when, after imperfections have been touched up, the picture is returned to the wall.

TO REMOVE A TIGHT-FITTING RING.—A novel method of effecting the removal of a ring which has become constricted around a swollen finger, or in any other similar situation, consists in enveloping the afflicted member, after the manner of a circular bandage, in a length of flat India-rubber braid, such as ladies make use of to keep their hats on the top of their heads. This should be accurately applied, beginning, not close to the ring, but at the tip of the finger, and leaving no intervals between the successive turns, so as to exert its elastic force gradually and gently upon the tissues underneath. When the binding is completed, the hand should be held aloft in a vertical position, and in a few minutes the swelling will be perceptibly diminished. The braid is then taken off and immediately reapplied in the same manner, when, after another five minutes, the finger, if again rapidly uncovered, will be small enough for the ring to be removed with ease.

WATER FOWLS AS BAROMETERS.—In a new book called "The Fowler in Ireland," Sir Ralph Payne Galwert states that the movements of the water fowl indicate approaching changes in the weather more surely than any barometer. Thus, if ducks fly but a short way after a shot, a violent gale may be confidently expected. "Snipe, like duck, will rest and feed in prospect of a disturbance of the elements. When the gale comes roaring down, perhaps accompanied by rain or sleet, these birds will rise from their retreat and whirl about like dead leaves in a murky sky." An arrival of wild swan intimates a severe frost. If they leave suddenly as they came, the weather will turn mild again. Herons will break away from their fishing when it is coming on to blow from a certain quarter, for they dislike beating homeward in the teeth of the wind.

GUM ARABIC.—In Morocco, about the middle of November, a gummy juice exudes spontaneously from the trunk and branches of the acacia. It gradually thickens in the furrow down which it runs, assumes the form of an oval or round drop, as large as a pigeon's egg, of different colors, as it comes from the red and white gum tree. About the middle of December the Moors encamp on the border of the forest, and the harvest lasts a full month. The gum is then packed in large leather sacks and transported on the backs of camels and bullocks to seaports for shipment. This is the gum arabic of commerce.

A CURIOUS INCIDENT occurred in Dallas, Ga., recently. A bale of cotton was taken to a compress to be weighed and stored. When put on the scales it was observed that the bale was warm. The trier was inserted and the bale found to be on fire in the center. It was taken out, and when opened burst into flames. Some considered it a case of spontaneous combustion, others that a spark might have fallen into the bale from the gin. At all events, the occurrence was uncommon.

GOOD HEALTH.

How Old People Die.

Most old people die from overfeeding or exposure. In old age the resisting power of the system is very greatly lessened, and a degree of exposure or indiscretion which might have been borne with impunity a few years earlier in life may be sufficient to disturb the vital machinery sufficiently to produce fatal results. Excess in eating is perhaps a more general cause of hastening dissolution in the old than any other form of excess. The diminished bodily activity renders less food necessary to supply the wants of the body; and when the amount of food taken is not proportionately reduced the system becomes clogged, the blood gross, excited, and filled with imperfectly elaborated material; the blood-vessels are surcharged, and, in consequence, the liability to apoplexy or some other form of paralysis is very greatly increased. Heavy feeding is absolutely dangerous for a man above fifty years of age. The blood-vessels are weakened in old age, sometimes to a very remarkable extent; and the fullness and congestion of the brain which result from excess at the table are almost as fatal as a dose of strychnia or a leaden bullet.

Excess in the use of meat is especially to be condemned in elderly persons. Flesh food is stimulating to the cerebral circulation, at the same time that it produces a tendency to plethora. Statistics show that the chances for life are much better for an elderly person in this country than in England, which may be attributable to the excessive use of flesh food in that country.

At this season of the year old people need to take special care to avoid getting chilled. Cold is one of the most deadly enemies of old age. A large share of the elderly people who die succumb to the influence of cold, inducing pneumonia. An abundance of warm clothing, with warm but well ventilated rooms, is essential to the old during the cold season of the year, and they should avoid the exposures which younger persons may endure without injury.—*Herald of Health.*

WORK A LAW OF NATURE.—Work is so thoroughly a law of nature for a man as well as animals, that any organ left inactive decays from day to day. Thus the well-being of an organ is indissolubly connected with its activity. One of the most curious illustrations of the above principle is the reaction which the amputation of a limb exercises on the brain. That organ regulates the movements of every member of a healthy body; but if one member be wanting, then the respective portion of the brain has nothing more to do, and consequently exhibits a tendency to wither away. Several instances have already been recorded which indicate a probable injury to the brain, resulting from deficient activity in some portion of the body. And now M. Bourdon has communicated to the Paris Academy of Medicine a case of brain-wasting arising from the amputation of a limb. A soldier, whose left arm had been removed some forty years ago, lately died from inflammation of the brain, after thirty-six hours illness, and the post-mortem examination showed that one side of the brain presented differences from the other. During the late years of the man's life the leg corresponding with the amputated arm gradually became lame, the injury done to the brain having, it is considered, reacted upon the leg.—*Sel.*

GIVE UP MEDICINES.—How precious is health! Wealth, honor, luxury, associations and friendships are of less value than health! Thousands of highly educated persons exclaim, "I would give ALL *for health.*" Multitudes who can talk intelligibly of nebulæ, leucocites, monads, and of equations, have become a trial to themselves and their friends, are fretful, hysterical, sensational, and even lax in morality? What is to be done? First, stop medicines of all sorts! Give up the gauntlet of tonics, stimulants, alteratives, sedatives, diaphoretics, antispasmodics, diuretics and neurotics, which have been applied in every conceivable way to the gastro-pulmonary and genito-urinary surfaces, to the nasal and serous membranes and external skin. Give up your liver pads, supporters, specifics, and relate yourself properly to nature's *materia medica!* Give up your blue mass, quinine, iron, ipecac, opium, chloral and bromides, and you have made the right start!

Now try to take hope into your soul! *Believe* you may become well, vigorous and useful, for it is true the most of you are curable.

Second. Put yourselves in proper relation to "deep breathing," sunlight, food, dress, sleep, motion, rest, water and self-hood! Do this at home, or in the best institution you know: it will make no difference, only so you continue and persevere in doing it.—*Herald of Health.*

THE GRAPE CURE.—The season for the grape cure begins in Europe in August, and continues from two to three months. Patients go to establishments in the vicinity of the vineyards, and, giving up their pipes, beer and flesh food, live on bread and grapes, or sometimes on grapes alone, from four to six weeks. In cases to which this cure is adapted the change for good is often wonderful. Gouty, rheumatic and over-fed persons improve most. The business is reduced to a system there, and physicians prescribe for patients at the cures as to amounts of grapes, variety, and length of time to continue it. There are in Europe a multitude of water cure and other health institutions which practice the grape cure at the proper season. Some of them are located in the mountainous regions, where patients can constantly behold most magnificent scenery, live in the forests and breathe the best of air. In this country we have excellent facilities for the grape cure, and hundreds have practiced it without medical advice, to great advantage.

THE PECK OF A HEN.—A short time since Mrs. John Preston, of Gwynedd, England, was pecked by a hen on the index finger of her right hand. The blow did not break the skin, but caused a very slight bruise. Nothing was thought of so trifling a wound until a few days after it was inflicted, when the finger began to pain and swell. The pain increased until it became almost unbearable, and the swelling did not cease until it had extended up the arm to the shoulder, when the finger burst from the knuckle-joint to the tip, and began to discharge a purulent substance, and has been doing so to the time of this writing. The swelling in the arm has subsided, and the wound is much less painful than at first. Although the patient has been under constant treatment by a skillful and successful physician from the first, the sore shows but little evidence of healing, and renders the patient almost powerless to do any thing. The case is certainly a remarkable one. Mrs. Preston is over 60 years of age.

ORIGIN OF SCARLET FEVER.—One of the most interesting medical theories yet broached is the hypothesis that scarlet fever originated with the horse and that inoculation from this animal may possibly be used as a preventive to the dreaded disease in the human being. Dr. John C. Peters, of New York City, who has prosecuted careful studies into this subject, is thoroughly convinced that he is right in his hypothesis, and he believes that it will be possible to reduce the equine virus by cultivation, so that healthy children may be inoculated against the disease.

A GOOD EXEMPLAR.—M. de Lesseps, the eminent French engineer, rears his children in the greatest simplicity. In diet, dress, and all habits of life, he endeavors to make their conditions as nearly natural and healthful as possible. He attributes his own remarkable vigor and vitality at an advanced age to the fact that his father entertained the same views respecting child rearing, and brought him up "like a young savage," at least in many respects. He asserts that "the children of the rich are over-fed, over-dressed, and under-exercised."

MINING AND SCIENTIFIC PRESS.

W. T. DEWEY W. B. EWER.

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A. T. DEWEY. W. B. EWER. G. H. STRONG.

SAN FRANCISCO:
Saturday Morning, Dec. 8, 1883.

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Passing Events.

This number of the PRESS contains a brief history or record of the firm of Dewey & Co., its publishers, which appears on the occasion of the 20th anniversary of the firm. The event was duly celebrated, as appears in another column.

Aside from what we have noted in our "Mining Summary," there is little to report concerning the mines. In this season of short days there is very little outside prospecting going on, except in the southeast and the southern part of this State. It is to be noted that of late miners have turned their attention more than usual to minerals which have before been considered comparatively valueless. This is good for the country, and our general mineral resources.

CABLE RAILROAD SUIT.—The Cable Railway Company has commenced suit against the Market Street Railway Company for infringement of patent. The Cable Railway Company are owners of the Hallidie patents, and it is claimed that these are being infringed. The suit is for $100,000 damages.

ON Monday the Idaho Mining Company declared a regular monthly dividend of $4 per share, amounting to $12,400. This is an increase of $2 per share over the November dividend. The mine is looking and yielding well.

A PROFESSORSHIP of German Language and Literature has been established at the State University, Berkeley.

Nickel in Lower California, Mexico.

Some years ago a vein of metal was found near the Real del Castillo, Baja California, 100 miles southeast of San Diego, which was supposed to be silver. Two samples were taken, which, when melted in a blacksmith's forge, yielded a large button of metal. This was tried for silver and for gold, but proved to be neither. A gentleman who happened to see it, at once pronounced it nickel. Nothing more was done about it at the time. A year ago the superintendent of the old Tunnel Company examined the ore and pronounced it nickel. A few weeks since Prof. Blair visited that section and at once discovered several large veins of good nickel ore. Some of the old gold mines carry gold, silver and nickel. Some of the new discoveries are of the same class; others carry silver and nickel, and others nickel only. Copper, arsenic, cobalt and antimony are more or less intermixed as bases. One of the veins is the arsenide of nickel, containing from 20 to 45 per cent nickel; another vein contains kupfer nickel, which runs from 35 to 40 per cent in nickel. Another carries nickel glance, yielding from 25 to 40 per cent of nickel, and another carries Emerald nickel, yielding from 20 to 35 per cent in nickel. These veins are from 3 to 8 feet wide. The mines are very accessible, being reached by a good wagon road. Three of them are within a mile of town, through which the survey of the "Bee Line" railroad passes—a road contemplated, and for which charters and subsidies have been granted—from National City, California, to the Mexican boundary line at Tia Juana; thence via the Real del Castillo, mouth of the Colorado river, Altar, in Sonora, to Magdelena. From there 20 miles will be built this winter, west towards Altar. Surveyors are now running a line from Magdelena east to cross the Mexican Central 100 miles north of the Chihuahua to Monterey, and thence to the Gulf of Mexico. The "Bee Line" railroad will pass within a mile of several of the new nickel mines.

Coal has also been discovered within three miles of the new mines. The coal is in veins or layers from 3 to 11 feet thick. Its quality is not yet known. It is probable that this new nickel belt extends southerly. Prof. Blair thinks that it covers the great mineral belt of the "Lost mine" which produces so much mineral, and has been assayed so many times for gold, silver and copper, and yet none found, and still no one has yet told what the metal was or is, except in one case. A sample of ore was sent to a good assayer who gave 15 per cent in nickel, $15 in silver and $17.50 in gold; and his sample was the average of the poorest mine in the district. It is the plan of Prof. Blair and his associates to further prospect and open the nickel veins. Some of the veins can be traced on the surface for more than a mile, the croppings, in places, reaching 6 or 8 feet above the surface, and 6 to 8 feet wide. The new discovery promises to open a new field for nickel.

Talc.

Although talc is known to occur in many places on this coast, it is not mined, as is the case in several States on the Atlantic seaboard. Pennsylvania is the principal producing center. The substance is used quite extensively in soap making, and for dressing fine leather, sheepskins, gloves, etc. The domestic talc is used instead of terra alba in the manufacture of paper. A small amount of talc also enters into the composition of some lubricating compounds.

By some persons it is estimated that as high as 50,000 tons of talc were mined last year, but official sources consider this estimate too high. The average spot value is about $12 per ton. The imported talc, of which $20,960 worth was received in the fiscal year 1882, is of generally superior quality, and the average price is about $22. What we import comes from Italy, Austria and France. It is found in several places in Arizona and in this State.

Talc is a soft magnesian mineral, of a soapy feeling, and usually of greenish, whitish or grayish colors, occurring in foliated or easily cleavable masses, and also in compact granular masses. In the latter condition it is called steatite or soapstone. Indurated talc is an impure slaty talc, with a nearly compact texture, and superior hardness to common talc.

Posting Location Notices.

Some little time ago some miners took up a claim of the ordinary dimensions. The discovery was made by tunnel, the position of which is on the southern side of the claim. Due notice of the application for patent was made by publication and posting of notice in the Land Office. A diagram of the claim and notice of application were also posted "in a conspicuous place, upon a tree about five or six feet east of the mouth of the discovery tunnel, where it could be easily seen and examined." The tree upon which the notice was posted was within the limits of the claim, but the location conflicted with another mineral claim to the extent of little more than half an acre. The mouth of the discovery claim laid within this area, which was excluded from the pending application. The tree on which the posting was made also stands within this tract.

The contestants—the owners of the other claim—tried to stop the men from getting the patent by calling the attention of the Land Office to the provisions of Sec. 2325 of the Revised Statutes, viz., that the applicant "shall post a copy of such plat, with a notice of such application for a patent, in a conspicuous place on the land embraced in such plat, previous to the filing," etc. And they contended that as the notice was not posted on the land actually applied for, the application for patent should be dismissed.

The matter was referred to the Commissioner of the General Land Office, who considered that the objection was insufficient to warrant the office in dismissing the application. The law requires that the posting on the claim shall be performed before application for patent is filed, and in a conspicuous place, on the land embraced in the survey. The plat of the survey embraced the entire claim, and the posting was on the land embraced in the plat. The fact that the application subsequently filed excluded that part of the land on which the notice was posted does not vitiate the notice. The posting was evidently in a conspicuous place, hard by the mouth of the tunnel, and thus the letter and spirit of the law were observed.

New Ore Screen.

A form of ore screen lately devised is made of broad-headed bars, the heads of which are of the same width from end to end, combined with supporting-bars, separating-washers and tightening-nuts and screws. The screen plates or bars are provided with broadened heads, and near each end have a hole formed in the body to receive the rods on which they are strung. Spacing-washers, formed with a flat space on top, are interposed between each pair of plates. The rods pass through these washers also, and at each end the rods are screw-threaded and provided with a tightening-nut, which, when screwed up, binds the bars and spacing-washers securely together.

The broadened heads of the bars are formed of the same width the entire length of the bars, and the bars are so mounted that the spaces between them shall be the same. This way of mounting bars is the usual one; but the T-headed bars commonly in use have had the heads tapered, being broader at one end than the other, and consequently the spaces between them varied in width from one end to the other. V-shaped bars have also been set up in this way, so that the spaces at one end shall be broader than at the other. In ore screens it is necessary that the bars retain their exact position; and separately-formed, broad-headed bars mounted to attain this end, combined with equidistant spaces, is a construction considered new by the Patent Office.

AN IMPORTANT LAND DISPUTE SETTLED.—The three-cornered fight which has been going on for a long time between M. M. Nathanson, D. S. Jones, and the heirs of J. R. Snyder, over a valuable tract of land lying contiguous to the north boundary of Sonoma, has been finally settled on appeal to the Secretary of the Interior. The Commissioner of the General Land Office decided in favor of Jones and Snyder's heirs, thus depriving Nathanson of the portion of the land on which he settled in 1855, and which he had continued to hold, cultivate and improve up to the present time, the whole tract being awarded to Snyder's heirs, with the exception of a small part held and cultivated by Jones since 1858. From the decision Nathanson appealed to the Secretary, who awards the land to Nathanson, except the portion cultivated and improved by Jones. Messrs. A. H. Evans & Co., of Washington City, appeared as counsel for Nathanson.

A Progressive Firm.

Dewey & Co.'s Twentieth Anniversary.

Last Saturday marked the 20th anniversary of the firm of Dewey & Co., publishers of this journal. In a comparatively new country like California, and in these days of rapid changes, twenty years is a long period over which to look back on the existence of a business house. The firm of Dewey & Co., publishers and patent agents, had its starting in the first issue of the SCIENTIFIC PRESS in December, 1863; and under the name of the MINING AND SCIENTIFIC PRESS the paper has been prosperously continued until now. With very few exceptions it is the oldest journal in this city or on the coast, and is the oldest mining paper in the United States.

W. B. Ewer and A. T. Dewey, the present owners of the paper, became proprietors in 1862 and 1863 respectively. Mr. George H. Strong, partner in and manager of DEWEY & CO.'S MINING AND SCIENTIFIC PRESS PATENT AGENCY, was then associated as chief draftsman and mechanical expert of the concern.

The Patent Department.

At the time of the organization of the firm the field in the patent business was very small indeed, most of the patents for this coast then being taken out by the Eastern agencies. It gradually became apparent to inventors, however, that there were decided advantages in being able to hold personal council with their agents and to examine the drawings and specifications before they were submitted to the Patent Office. It was, moreover, seen that a great saving of time was effected, there being no delay in the forwarding and return of papers for signatures, as was the case when dealing with distant agencies. Within a few years a steadily increasing business was built up, and the MINING AND SCIENTIFIC PRESS Patent Agency became the leading agency of the kind on the coast, a position it has maintained ever since. This has been accomplished by careful attention to the wants of inventors and a well-earned reputation for reliability, honesty and fairness.

The clients of this department of the firm are scattered from one end of the coast to the other, and a great number of them have done their business with Dewey & Co. for years. Nearly every important patented device on this coast in the last twenty years has been obtained by us. The peculiar machinery of this coast, mining and metallurgical appliances, harvesting machinery, cable railroad mechanism, etc., have been specialties with which the firm has had more to do than other agencies, and the knowledge acquired in handling all this business has been of incalculable advantage to inventors. During the years of existence of the firm a very valuable library has been accumulated, including works of reference, Patent Office reports, volumes of complete specifications and drawings of all U. S. patents, etc., until it has assumed large dimensions.

The Publishing Department.

The publishing department of the firm has increased in importance from very small beginnings until now there are some 40 employees in all connected with it. When the MINING AND SCIENTIFIC PRESS was first published it consisted of eight small pages. For many years it has been a sixteen-page illustrated journal, known and admired in every camp and city in the West. As an exponent of the industrial, mechanical and mining resources of the coast it holds the first place, and is acknowledged an honest, upright and able journal.

In this fact lies the reason of its perpetuity while so many speculating mining and stock journals have fallen by the wayside. It has never lent its columns to the advancement of schemes calculated to harm the public, and has kept free from all stock-gambling transactions of every kind. It is devoted to the interests of legitimate mining in all its branches, and the advancement of manufactures and mechanical industry among us.

The PACIFIC RURAL PRESS was established by Dewey & Co. in 1871, and, being candidly and reliably edited, at once took rank as a first-class agricultural journal. Conducted in an able manner by men well versed in the various branches, it has become an authority in all matters pertaining to agriculture on this coast, and has maintained its high standing.

Fraternal Journals.

But, while the establishment of the MINING

AND SCIENTIFIC PRESS and of the PACIFIC RURAL PRESS and their advancement to their present position have been accomplished, this work by no means represents all that has been done as publishers by the firm. A specialty has been made of fraternal publications. The *Golden Gate Sentinel* was purchased, and the PACIFIC STATES WATCHMAN established in its stead, this journal being devoted exclusively to the interests of the Ancient Order of United Workmen—an Order which has grown at a very remarkable rate, on this coast particularly. The State of New York alone exceeds in number the Workmen in California. The WATCHMAN is the official organ of the Order, having been officially indorsed by the Grand Lodge, and has done much to enhance and popularize the fraternity.

The FRATERNAL RECORD is another journal devoted, as its name indicates, to the interests of fraternal organizations. Some twelve of the best Orders are represented in its columns, and it has, like the WATCHMAN, certain features also which make it a favorite home paper. The firm has founded, and now publishes in addition to these fraternal papers, others of similar style, devoted to the interests of particular Orders.

The LADIES' HOME JOURNAL is devoted, as its name indicates, to the instruction, entertainment and advancement of women. Literature, art and fashion are represented in its columns. Other journals have been established and then merged into the present publications, and have helped strengthen and widen the circulation of the same.

A Thoroughly Established Firm.

The twenty years' experience has benefited the patrons of Dewey & Co. as well as the firm itself. It has now in its employment men specially fitted to take charge of its various departments and attend to its details, a number of whom have been with it for many years.

This is but a brief glance backward we have given. It would be difficult in a short space to recall the vicissitudes of so many years, or many details, important in themselves at the time, but merged now into the finished whole. The firm of Dewey & Co. may congratulate itself on having placed itself in the front rank with those established among the progressive people on this coast. The 20th anniversary of the firm was celebrated on the 1st inst., by a holiday given to the employees by the proprietors, and a social reunion and presentation in the evening, fuller reference to which is made in another column.

By the co-operation of the best talent procurable on the different departments and the dovetailing of one part to another, a strong, united feeling has existed, which has been of great value to the establishment. No firm could have succeeded so well in this business unless it had the facilities alluded to. The patent publishing, engraving, advertising, and other departments have helped each other in such a manner as to make a strong whole.

All of the present publications of the firm are illustrated. Indeed, Dewey & Co. have made a specialty of illustrated periodicals, and have made thousands of engravings since their establishment in business.

Though in the earlier days of the existence of the firm a struggle was necessary to establish the journals on a firm foundation, of late years the reputation for energy, perseverance and honesty which it has attained has been of much benefit to it, that more recent attempts at enlargement have prospered well. The firm has long been established on a sound financial basis and its success has been continuous.

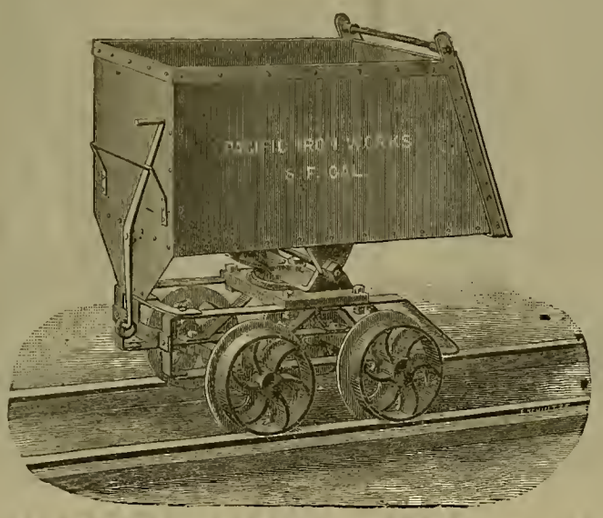
The editors assume responsibility for the statements in the sketch, it having been prepared without asking the consent of the publishers.

UTILIZING SUBTERRANEAN HEAT. — Many methods have been proposed for utilizing the internal heat of the earth, and if we remember that the temperature increases at an average rate of about 1 deg. F. for each 50 feet of increasing depth, it will be readily seen that such utilization is quite possible. It is probable, however, that the excavation of wells deep enough to boil water and produce steam, would involve a greater cost than the production of steam by the combustion of coal or by solar heat. The Japanese are seriously considering the utilization of the hot springs near Tokio, as a means of producing heat and power. The subject has been discussed in the Japanese Seismologic Society. In a country where the presence of hot springs and the frequency of earthquakes indicate a rapid increase of subterranean temperature, the thing may be quite practicable. It has even been questioned whether the extraction of the heat would not diminish in some degree the frequency and intensity of earthquakes.—*Soc. des Ing. Civ.*

A Pleasant Reunion.

It is not often that the attention of our readers is called to matters personal to the proprietors or editors, but in this instance it may be considered excusable, since the occasion for it is one that may interest them. The first day of the month marked an era in the existence of the firm of Dewey & Co., publishers of this journal. It was the 20th anniversary of the formation of the firm. The employees received a holiday with the compliments of the firm, and returned a vote of thanks for the courtesy.

Some of the oldest of the employees had arranged a quiet little programme for a celebration of their own, aside from the holiday portion, not desiring to see the gifts all on one side. The one who had been longest with the firm—some 13 years—had invited the married ones to dine at his residence in the afternoon; and had arranged for the principal employees to come there later in the evening.



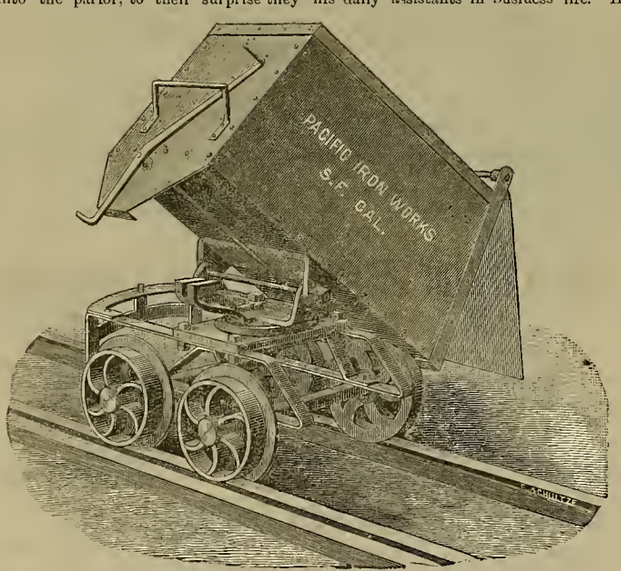
STANDARD FORM OF ORE CAR.

After dinner, when the ladies and gentlemen came into the parlor, to their surprise they found a number of acquaintances awaiting there ready to offer congratulations. Mr. E. J. Wickson, Editor of the PACIFIC RURAL PRESS, on behalf of his brother employees, made a few remarks on the history of the firm and the occasion of the gathering, concluding by presenting a silver tea service to each of the members of the firm as a mark of esteem from the employees. With each present was a copy of the following, signed by the employees, one being addressed to W. B. Ewer and the other to A. T. Dewey:

SAN FRANCISCO, Dec. 1, 1883.

Dear Sir:—We wish you to accept from us, on the occasion of the twentieth anniversary of the firm of Dewey & Co., a slight testimonial which may in future remind you, not only of your past and present employees, but also of our good wishes for the continued prosperity of the individuals and the firm. All of us have been for years in the employment of the firm, and hope that its progressive advance will be uninterrupted; its business continue to widen and increase; that its present members will many years conduct its fortunes; and that the name of Dewey & Co. will long be a familiar one, the length and breadth of the Pacific coast, the welfare of which it has done so much to foster.

Mr. W. B. Ewer responded to the sentiments expressed, in a happy manner, though somewhat "taken aback" with surprise. He reviewed the early difficulties the firm had labored under, and spoke of its present position, sketching briefly some of the events in its history, and thanking his friends for their interest in its fortunes. Mr. A. T. Dewey also thanked those present for their unsolicited good wishes and kindly feelings towards himself and partner. He spoke feelingly of the relation of employer and employed, and hoped that these friendly relations now existing would always be maintained. He spoke also of the progress of the firm since its inception, and of the genuine pleasure it gave him to see himself surrounded on that social occasion with so many who were his daily assistants in business life. He felt proud to think they had met to do himself and partner the honor they had, and was grateful for the kindly sentiments expressed. He expressed thanks for the handsome memento he had received, and would treasure it far beyond its intrinsic value. He felt confident that although this was the 20th anniversary of the firm, it was now but fairly started in its progress, and that much of its work was yet to come. Its present position gave it the advantage for still more earnest work, which he felt satisfied could, in the light of past experience, be readily carried out. He felt that the firm had laid the corner-stone and foundation of an improved system of journalism that will rank hereafter higher in the estimation of intelligent and progressive communities. It had been their desire as publishers to meet the higher wants of the community, in affording journals free from the ordinary objectionable features, and pure in tone and subject.



ORE CAR DISCHARGING LOAD.

Mr. J. C. Hoag, on being called upon, in a happy vein told those present of the estimation of the firm in the business world, and extended some complimentary remarks to its members. Mr. George H. Strong, manager of the Patent Department, and Mr. W. B. Turner, editor of the PACIFIC STATES WATCHMAN, also made a few pleasant remarks. The host of the evening expressed the pleasure of himself and wife in seeing so many associates assembled socially around the hearthstone, and congratulated the members of the firm of Dewey & Co. on reaching so advanced an anniversary. Refreshments were partaken of by those present, and the evening passed pleasantly in social converse. Reminiscences were indulged in, and the cares of business and every-day life banished for the time. The employees succeeded perfectly in their endeavor to surprise Messrs. Dewey and Ewer, neither of whom had the slightest intimation of the presentations. The presence of the ladies lent an added charm to the pleasures of the evening.

A souvenir of the anniversary, presented by the hostess during the evening, consisted of a cabinet-size photograph, with reduced facsimiles of the "headings" of the various newspapers and periodicals which had been established or published by the firm of Dewey & Co. These are so arranged as to surround portraits of A. T. Dewey and W. B. Ewer, and a panel suitably inscribed. Above is a representation of a printing press, and on each side are scrolls with the figures "1863" and "1883." The card forms a very neat and appropriate souvenir of the occasion.

Standard Ore Cars.

The above cuts represent the Standard end and side dumping ore cars, size of body, 32x24x30 inches; capacity, about 1,200 pounds; gauge of track 18 inches to 20 inches, as may be desired. It is very strong, made entirely of iron, the body being of ¼-inch boiler plate, well banded and joined with angle iron. The running gear is of wrought iron, securely braced and riveted together with chilled "cap" wheels. These wheels are made in such a manner that they cover the journal of the axle entirely, preventing under wear by keeping out sand and grit, a matter of much importance. The car is well made, properly balanced, light running and easily handled. It is made in this city, by Rankin, Brayton & Co., Pacific Iron Works, and is a very superior ore car. A large number of this type are in use.

DEATH OF REV. S. S. HARMON.—In the death of the Rev. S. S. Harmon, of the Harmon Seminary, of Oakland, the educational interests of this State suffer a severe loss. For many years an instructor, his ripe experience and judgment was of great value in many ways. Rev. Mr. Harmon was well known throughout the State for his clerical and educational work. He was born in Richland, N. Y., May 24, 1818. He graduated with honors at Union College in 1843, and in the following year married Miss Frances Walsworth, with whose assistance he conducted an academy in Orange county, until he was admitted to the Presbyterian ministry in 1850. In 1853 Mr. and Mrs. Harmon came to California and labored in church and school in Sonora, Tuolumne county, for ten years. In 1863 they moved to Oakland, and conducted the Female College of the Pacific, and in 1868 they opened a college at Santa Barbara, and experienced several successful and prosperous years. In 1872 they accepted the charge of Washington College, then new, and opened it as a mixed school, with a full complement of pupils. At the end of ten years' labor in Washington College, Mr. and Mrs. Harmon perceived an opening in Berkeley for a select school for young ladies, and they opened the Harmon Seminary at that place. This institution has become popular and successful, and will be continued in the spirit of its founder by Mrs. Harmon and her children.

WORK on the bridge for the Oregon Short Line, at the mouth of Burnt River across Snake River, is progressing rapidly. The other bridges across Snake River are nearly completed. The upper bridge, near the mouth of the Boise, will be finished in ten days. The Oregon Railway and Navigation Company is crowding vigorously railroad work between Baker City and the town of Huntington. Nearly all the earthwork will be completed this winter, and the road be ready for iron early next spring.

THE Secretary of the Treasury has sent word to N. W. Spaulding, Assistant Treasurer at Francisco, to have $50,000 in ten cent pieces coined at San Francisco, so as to satisfy the demand for subsidiary silver there. He also informed Spaulding that he would send him $20,000 in five cent nickels.

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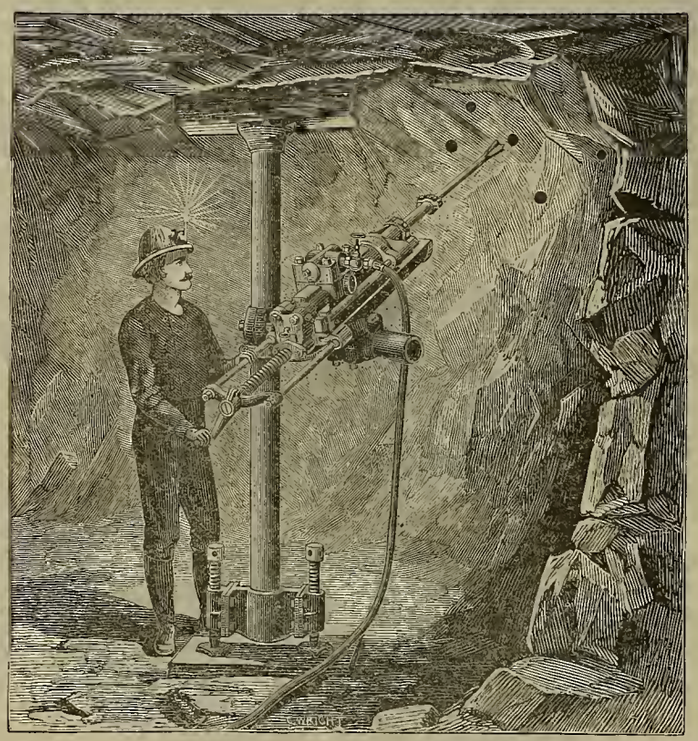
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Rand, improved, 3½"	1.041 "	"
Ingersoll, D2 3", beat Rand 3½"	.744 "	"
Ingersoll, D2 3", beat National 3½"	.505 "	"
Ingersoll, E 3½", beat Rand 3½"	.560 "	"
Ingersoll, E 3½", beat National 3½"	.321 "	"
National beat Rand	.139 "	"

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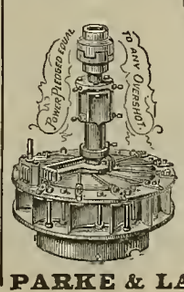
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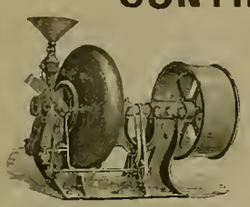
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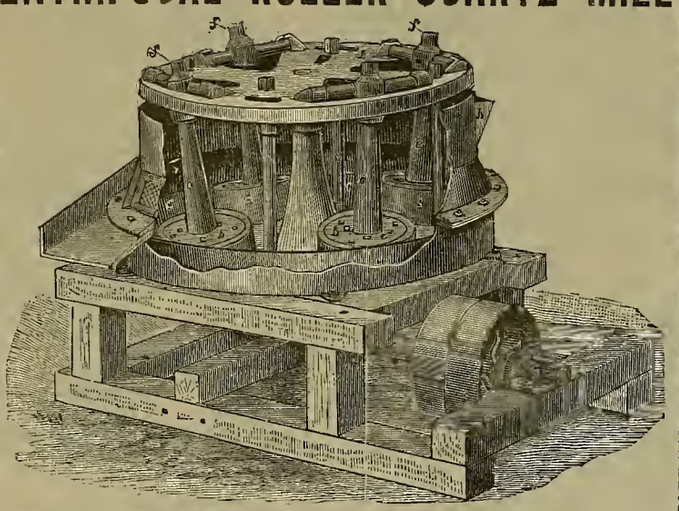
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MILLS ERECTED WITH ALL APPLIANCES COMPLETE.

After running one of these mills on the Whidden mine, in El Dorado County, over four months, and thoroughly testing its capacity and durability, I am prepared to offer it to the mining public, and claim for it the following advantages over the drop-stamp mill:

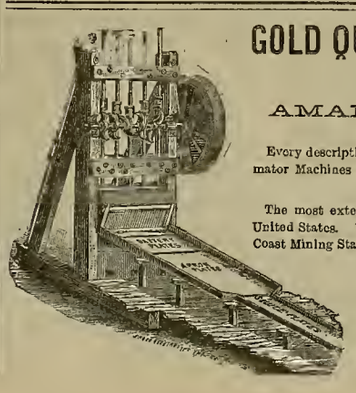
1. The cost of same capacity is not more than one-half that of stamps.
2. Freight to mine one-fourth that of stamps.
3. Cost of erection at mine one-tenth that of stamps.
4. It runs with one-third the power per ton of ore crushed.
5. The wear is less than that of stamps.
6. The wearing parts are easily duplicated.
7. It has a much better discharge, and leaves the pulp in better condition for concentrating.
8. It is a better Amalgamator, saving fully nine-tenths of the gold in the mill; the balance can be saved on plates in the usual manner.
9. It is continually crushing; not like the stamp, using power to suspend it in air ninety-nine one-hundredths of the time and the balance making a thundering noise, and accomplishing *comparatively* small results. It is as far in advance of the stamp mill as the present method of making flour with improved rolls is over the Indian's mode of crushing corn in a stone mortar.

PATTEN'S CONCENTRATOR.

This machine requires less power, less care or attention, and is less liable to get out of repair than any concentrator now in use; all of which any practical miner will comprehend when seeing it in operation.

The wear and tear is nominal, and the construction so simple that any miner can put it up and run it, and the low price brings it within the reach of all mill men, as it will save enough to pay for itself in any mill in a very short time. One machine will concentrate the tailings from a five-stamp battery.

SHINGLE MACHINES AND SAWMILL MACHINERY OF EVERY DESCRIPTION.



GOLD QUARTZ and PLACER MINERS'

Silver Plated

AMALGAMATING PLATES,

For Saving Gold.

Every description of plates for Quartz Mills and Wet or Dry Placer A malgamator Machines made to order, corrugated or plain.

OVER 2,000 ORDERS FILLED.

The most extensive and successful manufacturer of these plates in the United States. Will fill orders for delivery in Rocky Mountain and Pacific Coast Mining States at lower prices than any other manufacturer.

Old Mining Plates Replated. Old Plates bought, or gold separated for low percentage of result.

SEND FOR PRICE LIST.

SAN FRANCISCO PLATING WORKS,

653 & 655 Mission St., San Francisco, Cal

E. G. DENNISTON, Proprietor.

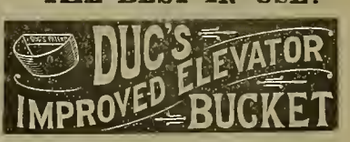
N. W. SPAULDING'S



PATENT DETACHABLE TOOTH SAWS,

Manufactory, 17 & 19 Fremont St., S. F.

THE BEST IN USE!



This is the only Scientifically Constructed Bucket in the market It is struck out from charcoal stamping iron. No corners to catch. No seams to burst. No interior corners to clog up. It runs with great ease, and half the power of the old style bucket. WILL OUTWEAR HALF A DOZEN OF THEM.

PRICES REDUCED.

T. F. ROWLAND, Sole Mfr.

Brooklyn, N. Y.

H. P. GREGORY & CO., Agents, San Francisco, Cal., carry a stock of all sizes.

Patent Life-Saving Respirator.

PREVENTS LEAD POISONING AND SALIVATION.

Invaluable to those engaged in dry crushing quartz mills, quicksilver mines, white lead corroding, feeding thrashing machines and all occupations where the surrounding atmosphere is filled with dust, obnoxious smells or poisonous vapors. The Respirators are sold subject to approval after trial, and, if not satisfactory, the price will be refunded. Price, $3 each, or $30 per dozen Address all communications and orders to



H. H. BROMLEY, Sole Agent,

43 Sacramento Street, San Francisco, Cal.

RICHARD C. REMMEY, Agent,

Philadelphia Chemical Stoneware Manufactory,

1100 East Cumberland St., PHILADELPHIA, PA.



Manufacturer of all kinds of **Chemical Stoneware** —FOR— **Manufacturing Chemists.** Also Chemica Bricks for Glover Tower.

"DUNCAN"

ROCK DRILL!

FOR MINES, QUARRIES, ETC.

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FINE PHOTO-ENGRAVING

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING NOVEMBER 27, 1883.

289,060.—KEY SEAT CUTTING MACHINE—Geo. W. Bonds, S. F.

289,064.—EXTRACTING PRECIOUS METALS BY LEAD BATHS—Brown & Gates, S. F.

289,217.—GAME TABLE—George Calder, Mill Creek, U. T.

289,079.—PUMP—C. L. Fonts, S. F.

289,245.—DRAWER PULL—F. Frank, Suisun, Cal.

289,094.—SHINGLE SAWING MACHINE—O. C. Hanson, Eureka, Cal.

289,105.—BUILDING FRONT—P. H. Jackson, S. F.

289,107.—SEWER GATE—Samuel Johnson, S. F.

289,108.—SEWER GATE—Samuel Johnson, S. F.

289,268.—ANIMAL TRAP—George W. Jolly, Paraiso, Cal.

289,010.—CELL CASE FOR EGGS—Jos. Lyman, San Jose, Cal.

289,114.—TIRE TIGHTNER—H. B. May, Oregon City, Or.

289,118.—HARROW, ROLLER, ETC.—J. D. McKinnon, Portland, Ogn.

289,295.—LAYING PAVEMENT—Wm. M. McLane, Los Angeles, Cal.

289,127.—CULTIVATOR—R. K. Nichols, Lower Lake, Cal.

289,128.—CAR BRAKE—Jas. O'Donnell, S. F.

289,134.—DIRT SCRAPER—Jas. Porteous, Fresno, Cal.

289,149.—METALLIC FENCE POST—D. B. Scott, Shingle Springs, Cal.

289,159.—ASH HOIST—John D. Spreckels, S. F.

289,040.—RAILWAY AND CATTLE WATER SUPPLY—C. P. Sykes, Calabasas, A. T.

289,194.—WATER HEATER—J. B. Webster, Los Angeles, Cal.

14,438—DESIGN FOR BRACELET—R. H. Ahn, S. F.

14,442.—DESIGN FOR WIRE FENCE—G. Hunziker, Cloverdale, Cal.

14,444.—DESIGN FOR CAKE SOAP—Anthony Lucy, S. F.

3,713—LABEL.—N. W. Griswold, Alameda, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific Coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

METALLIC FENCE-POST.—David B. Scott, Shingle Springs, El Dorado Co., Cal. No. 289,149. Dated Nov. 27, 1883. As a substitute for wooden fence-posts, it is claimed by many that the angle-iron fence-post comes nearest the requirements of strength, durability and economy. These posts are usually tapered at their lower end and driven into the ground. They will not, however, hold in hard or soft soils against the upward strain of the wires when drawn to a proper tension to fasten them; and this is the case especially where the face of the country is rolling, hilly, or cut up by deep ravines which have to be crossed. In such ground, if driven when the earth is dry, they hold for a time; but when it becomes soft in wet weather, the strain of the wires, which did not move when placed, will have a tendency to draw them from the ground, as their shape and smooth surface is not such as to resist the lifting force. This is more especially the case on the Pacific Coast, where the ground is baked by the summer heat and softened by the winter rains. The object of this invention is to provide means for resisting or counteracting the upward strain of the wires at all times, in any soil. Mr. Scott provides an improved screw-point and anchor-bars to keep the posts in position.

SEWER-GATES.—Samuel Johnson, S. F. No. 289,107. Dated November 27, 1883. This is a gate which is designed for temporarily checking the flow of water in sewers; and it consists of two sections overlapping each other at or near the center, and with a means for adjusting so that their edges will fit the walls of the sewer. A rod or bar having its outer ends threaded with right and left screws, respectively extends across the back of the gate, and large nuts fit the screws upon its opposite ends. The outer faces of the nuts are beveled so that when forced outward by turning the screws, they will bind against the walls of the sewer and hold the gate firmly in place.

MACHINE FOR SHELLING PEASE.—Alfred Swiugle, S. F. No. 288,743. Dated Nov. 20, 1883. This machine for shelling pease consists in a combination of a horizontal, perforated traveling belt, having projecting teeth, with another horizontal toothed belt, means for moving the latter above the former in the same direction and at a higher rate of speed, and means for imparting a transverse vibratory motion.

If you want a lubricant that will run any thing cool write CHARLES J. WOODBURY, GENERAL MANAGER LUBRICATING DEPARTMENT CONTINENTAL OIL AND TRANS. Co., for "Lubrice." It is the best compound grease in the market. Shipped in 5, 10 and 25-pound cans, half barrels and barrels. Warranted to give satisfaction. Observe the numbers: No. 2 is soft for outside work; No 3 is medium soft; No. 4 is medium hard; No. 5 is very hard, where unusual lubrication is demanded. Send for Catalogue of Lubricating Oils

To Our Friends and Patrons:

Twentieth Anniversary Compliments.

Dec. 1st, 1863. Dec. 1st, 1883.

FROM THE FIRM OF

DEWEY & COMPANY,

SAN FRANCISCO.

W. B. EWER, A. T. DEWEY. United, Reasonable, Persevering. Newspaper Publishers and Editors.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alta S M Co	Nevada	27	25	Dec 1	Jan 4	Dec 20	B Burris	309 Montgomery st
Andes S M Co	Nevada	23	25	Nov 10	Dec 20	Jan 9	B Burris	309 Montgomery st
Baker Divide M Co	California	8	20	Dec 5	Jan 7	Jan 28	W G Hughes	330 Pine st
Boston Con M Co	California	5	25	Nov 21	Dec 24	Jan 14	F E Luty	330 Pine st
Bullion M Co	Nevada	28	20	Nov 16	Dec 18	Jan 7	J N Brazell	320 Montgomery st
Bodie Tunnel Co	California	3	15	Nov 1	Dec 7	Dec 27	C C Harvey	309 California st
Benton Con M Co	Nevada	11	10	Nov 1	Dec 6	Dec 24	W H Watson	302 Montgomery st
Buena Vista Petroleum Co	California	31	25	Oct 30	Dec 5	Dec 27	L Kennann	220 Sansome st
Caledonia M Co	Dakota	14	10	Oct 31	Dec 13	Jan 11	W L Oliver	328 Montgomery st
Columbus Con M Co	Nevada	1	25	Nov 5	Dec 10	Jan 3	J M Buffington	309 California st
Day S M Co	Nevada	14	30	Dec 1	Jan 7	Feb 5	E M Hall	327 Pine st
Eureka Tunnel Co	Nevada	2	50	Nov 9	Dec 10	Jan 11	J Pardy	Eureka Nevada
Gould and Curry S M Co	Nevada	46	50	Nov 7	Dec 12	Jan 3	A K Durbrow	309 Montgomery st
Gold Lead M Co	Nevada	4	5	Nov 9	Dec 17	Jan 8	J Bronzan	328 Montgomery st
Hale & Norcross M Co	Nevada	79	50	Nov 17	Dec 21	Jan 14	J F Lightner	309 Montgomery st
Henrietta Gravel M Co	California	7	02	Oct 23	Nov 25	Dec 14	L Gross	330 Washington st
Independence M Co	Nevada	12	20	Dec 1	Jan 4	Jan 28	J W Pew	310 Pine st
Loreto M and M Co	Mexico	5	50	Dec 5	Jan 7	Jan 24	H G Jones	327 Pine st
Mayflower Gravel M Co	California	21	10	Nov 26	Dec 27	Jan 15	J Morizio	328 Montgomery st
McElroy Gravel M Co	California	11	25	Oct 25	Nov 30	Dec 26	J T Fogarty	306 Montgomery st
Mexican Con M Co	Arizona	1	50	Nov 30	Jan 1	Jan 28	W Willis	309 Montgomery st
Original Keystone M Co	Nevada	7	30	Nov 21	Dec 22	Jan 10	F E Luty	330 Pine st
Savage M Co	Nevada	27	50	Nov 3	Dec 7	Dec 27	E B Holmes	309 Montgomery st
Union Con M Co	Nevada	24	50	Oct 15	Nov 20	Dec 11	J M Buffington	309 California st
Wide Awake M Co	Arizona	17	20	Nov 17	Dec 28	Jan 28	C Hildebrandt	320 Sansome st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Alhambra M Co		F J Schwarze	324 Washington st	Annual	Dec 10
Bechtel Con M Co	California	W H Lent	309 Montgomery st	Annual	Dec 17
Elko Con M Co	Nevada	F Sperling	309 California st	Annual	Dec 17
Gould & Curry M Co	Nevada	A K Durbrow	309 Montgomery st	Annual	Dec 17
Hazel Center & Tranquility M Co	Arizona	J W Pew	310 Pine st	Annual	Dec 17
Mt. Diablo M Co	Nevada	R W Heath	318 Pine st	Annual	Dec 19
Ophir M Co	Nevada	C L McCoy	309 Montgomery st	Annual	Dec 19
Ontario S M Co	Utah	C Stump	309 Montgomery st	Annual	Dec 15

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Bulwer Con M Co	California	W Willis	309 Montgomery st	15	July 2
Idaho M Co	California			4.00	Dec 2
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	Nov 19
Mt Diablo M Co	Nevada	R W Heath	318 Pine st	25	Nov 26
Standard Con M Co	California	Wm Willis	309 Montgomery st	Two of 25	Dec 12
Silver King M Co	Arizona	J Nasb	315 California st	25	July 12

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Nov. 14.		WEEK ENDING Nov. 21.		WEEK ENDING Nov. 27.		WEEK ENDING Dec. 5.	
Alpha	1.15	1.60	1.05	1.35	....	1.65	.70	.90
Alta	1.00	1.45	1.00	1.25	1.05	1.35	.75	1.05
Andes	.35	.65	.35	.40	.40	.55	.20	.30
Albion	....	.40	....	.40	....	....	....	....
Argenta	....	....	....	.10	....	....	....	....
Atlas	....	....	....	....	....	....	....	....
Belcher	.85	.90	....	....	....	.80	.80	.90
Belding	....	....	....	....	....	....	....	....
Best & Belcher	3.00	3.60	3.00	3.35	2.65	3.55	2.25	2.75
Bullion	.50	.65	.45	.50	.40	.65	.20	.25
Bechtel	....	....	....	....	....	....	....	....
Belle Isle	.40	.45	.35	.40	....	.30	....	.30
Bodie Con	.25	.35	.35	.50	.30	1.25	.75	.95
Benton	.10	.15	.05	.10	.05	.15	.05	.15
Bodie Tunnel	....	....	....	.20	....	....	....	....
Caledonia	.10	.15	....	.15	....	....	....	.15
California	.25	.30	....	.25	....	.25	.15	.25
Challenge	....	.35	....	.35	....	....	....	.15
Chollar	1.65	2.15	1.65	2.05	1.85	2.05	1.55	1.90
Confidence	1.30	1.50	1.30	1.50	1.10	1.60	.70	.90
Con. Imperial	....	.08	....	.05	....	....	....	....
Con. Virginia	.35	.45	.40	.45	.35	.45	.25	.35
Crown Point	.80	1.05	.85	.95	.80	1.00	.60	.75
Day	....	.40	....	....	....	.40	....	.30
Elko Con	.20	.40	....	.20	....	.20	....	.20
Eureka Con	....	3.85	....	8.85	3.50	4.10	2.95	3.45
Eureka Tunnel	....	.05	....	....	....	....	....	....
Exchequer	.35	.45	.35	.40	.30	.40	.20	.30
Grand Prize	.30	.40	.25	.30	.25	.35	.20	.30
Gould & Curry	1.20	1.65	1.25	1.50	1.10	1.50	.85	1.15
Hale & Norcross	1.35	1.80	1.35	1.60	1.05	1.80	.70	1.10
Holmes	....	....	....	....	.30	1.00	1.00	1.10
Independence	....	....	....	....	....	....	....	....
Juba	....	....	....	....	....	....	....	....
Justice	.15	.30	....	.25	.20	.25	.15	.25
Jackson	....	....	....	....	....	....	....	....
Kentuck	....	2.50	....	....	....	....	....	....
Martin White	....	.25	....	.25	....	....	....	....
Mono	....	....	....	....	.40	.50	....	.15
Mexican	2.25	2.95	2.25	2.70	2.20	2.80	1.70	2.30
Mt. Diablo	....	3.00	3.25	....	....	3.25	2.60	3.10
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	....	....	....	....	....	....	....	....
Northern Belle	....	4.00	3.90	5.80	....	2.00	.80	1.40
North Noonday	....	....	....	....	....	....	....	....
Navajo	3.70	3.85	3.70	3.75	3.80	3.90	3.70	3.75
North Belle Isle	....	.55	....	.50	....	.50	....	....
Occidental	....	1.00	1.00	1.20	.70	1.20	....	.75
Ophir	3.70	4.05	3.70	3¾	3.60	5.75	5.75	5¾
Overman	....	.20	.20	.25	....	.20	....	.15
Oro	....	....	....	....	....	....	....	....
Potosi	.55	.75	.60	.65	.65	.75	.50	.80
Pinal Con	....	....	....	....	....	....	....	....
Savage	.50	.80	.50	.60	.30	.70	.15	.70
Seg. Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	3.20	3.90	3.20	3.65	2.50	3.55	2.15	2.70
Silver Hill	....	....	....	....	....	....	....	....
Silver King	....	7.75	....	7.75	....	....	7.00	7.75
Scorpion	.45	.50	....	.50	.40	.50	.35	.40
Tuscarora	....	....	....	....	....	....	....	....
Union Con	2.60	3.75	2.60	2.70	2.65	3.65	2.50	2.80
Utah	1.30	2.25	2.20	2.30	1.40	2.05	1.05	1.60
Ward	....	....	....	....	....	....	....	....
Wales	....	....	....	....	....	.25	.20	.30
Yellow Jacket	2.50	3.30	2.30	2.90	2.05	3.15	1.50	1.95
	....	....	....	....	....	....	....	....

SEWER GAS TRAP.—The Garland sewer gas trap has been placed in the Lick House, Mr. William Sherman, of the Lick Trustees, being convinced of its efficacy. This is a California invention which has been very successful in its results, having been widely introduced within the past few years. Many large hotels and public buildings, as well as private families, have adopted it.

Sales at San Francisco Stock Exchange

THURSDAY A. M., Dec. 6.

100	Andes	20c	
1150	Argenta	25c	
20	B. & Belcher	2.40@2.65	
230	Bodie Con	80c	
200	Benton	15c	
50	Belcher	90c	
150	Chollar	1.70	
15	Crown Point	90c	
20	Gould & Curry	85c	
750	Hale & Nor	85c	
100	Justice	2sc	
170	Mexican	1.90	
220	Northern Belle	45c	
100	Overman	20c	
500	Potosi	75c	
530	Savage	70@75c	
550	Sierra Nevada	2.45	
100	Utah	1.25	
570	Union Con	2.40	
125	Yellow Jacket	1.80	

AFTERNOON SESSION.

350	Alta	95c	
50	Alpha	1	
75	Bodie	75c	
70	Best & B	2.45@2.50	
50	Bullion	30c	
400	Benton Con	14c	
250	Chollar	1.70	
170	Con. Virginia	25@30c	
10	Confidence	80c	
600	Exchequer	30c	
325	Gould & Curry	90@95c	
600	Grand Prize	25c	
50	Julia	05c	
200	Justice	25c	
350	Mexican	2.00	
25	Mt. Diablo	2.90	
325	Ophir	5¾	
45	Occidental	75	
100	Potosi	70c	
315	Savage	70@75c	
505	Sierra Nevada	2.70@2.75	
400	Union	2.65	
30	Utah	1.40	
150	Yellow Jacket	1.85	

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $4 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turning a leaf.

Mining Share Market.

The stock market seems to be demoralized. Indeed the brokers are evidently turning their attention to other things than mining stock, and going to deal in grain more than formerly. Of course a good strike in the Comstock mines would no doubt start up a small boom again; but it is hardly probable that the mining share market will ever be of the importance it formerly was. The Ophir Company are extracting about 500 tons of ore per week from their 150 level, which ore is being sent to mills on the Carson river for reduction. It is nearly all fillings of very low grade. At the middle mines prospecting is pretty much at a stand. In the Chollar and Potosi no attempt has been made to prospect in a long time. At the Savage they tried it for a time on the 2700 level, but found themselves headed off in every direction by water, so were obliged to return to the main incline and put in the time at sinking that until the new hydraulic pump shall make it safe for them to crosscut in the wet ground above. At Gold Hill the Yellow Jacket, Crown Point and Belcher companies are taking out all the ore the mills on the Carson river can reduce with the present stage of water. The Alta folks have drained their mine nearly to the 2150 level.

New Ore Mill.

Mr. John J. Newsom, the architect of this city, has just obtained a patent through the MINING AND SCIENTIFIC PRESS Patent Agency, for an attrition mill, or apparatus for grinding quartz, etc. The die has a cup-shaped depression, into which ore may be received. Ribs are formed around the interior of this die, so that when it is filled with rock the latter will be prevented from slipping within the die, and will partake of its motion. The die is fixed to a suitable plate or disk secured to the upper end of a vertical spindle or shaft, which is revolved by any convenient power. The vertical adjustment of this spindle is effected by a wedge, which may be moved beneath the spindle-step by a screw. The disk has a flange or rim around its circumference considerably larger than the die.

Above the die is a hollow cylindrical shoe, also provided with ribs on its interior, or made of a polygonal shape. This shoe is secured within a hand, the whole being fixed to and supported by a stationary framework. A hopper is placed above it. Around the disk and hand, with their shoe and die, is fixed a case of sheet metal, or other suitable material, this case being closely covered above, and having a central aperture, through which the vertical shaft passes, and a flange around this aperture extends up near to the bottom of the disk, so as to prevent the escape of dust. Around this flange and between it and the outer wall is an inclined channel or flow, which receives the pulverized material after it escapes over the rim of the disk and conducts it to the point of discharge. Cleats or lugs are fixed around the interior of the case to receive and support the amalgamated copper plate, against which the finely pulverized pulp will be thrown by the action of the rotating disk.

The operation of this machine of Mr. Newsom's is as follows: Ore or rock in sufficiently small fragments is placed in the hopper and fills the hole, the hollow cylindrical shoe and the revolving die. The ribs in the interior of the die cause the fragments of rock contained in it to revolve with the die, while the ribs in the shoe above hold the rock within it nearly or quite stationary. The die is set with its periphery sufficiently near to that of the shoe, by means of the wedge-key in the step, and the space between the die and shoe thus formed serves for the escape of the pulverized material as fast as it is formed. The dust escapes when ground fine enough, and passes into the space between the rim, from which it eventually escapes over the top into exterior casing and passes down the chute to the escape. The disk and rim are made heavy enough to act as a fly-wheel and keep up the motion under the irregular strain of the work.

Bullion Shipments.

Grand Prize, Nov. 27, $4,500; Paradise Valley, 28, $2,035; Silver City, 27, $2,205; Richmond Con., 28, $17,969; Idaho, 30, $11,453; Hanauer, 25, $5,187; Hanauer, 26, $2,525; Vienna, 25, $1,668; Ontario, 25, $11,101; Horn Silver, 25, $12,000; Hanauer, 27, $5,200; Stormont, 27, $18,000; Hanauer, 28, $4,754; Vienna, 28, $1,578; Ontario, 28, $4,154; Horn Silver, 28, $12,000; Alice, 29, $14,330; Ontario, 29, $6,493; Hanauer, 29, $4,907; Crescent, 29, $1,550; Eureka, 29, $11,046; Hanauer, Dec. 1, $7,596; Horn Silver, 1, $18,000; Ontario, 1, $12,441; Tintic, 1, $1,872; Hanauer, 2, $5,300; Ontario, 2, $6,215; Horn Silver, 2, $12,000.

WHAT'S the use having dyspepsia? Why beleh and say you've got heartburn every time you eat? Be sensible; take Brown's Iron Bitters and be cured.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. W. A. WRIGHT—Merced and Tulare counties.
JARED C. HOAG—California.
B. W. CROWELL—Nevada.
I. M. LEHJY—San Bernardino and San Diego counties.
J. J. BARTELL—Santa Clara county.
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A. S. DENNIS—San Mateo county.
A. C. KNOX—Colusa, Tehama and Yolo counties.
A. J. DUDGEON—Mendocino and Humboldt counties.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time they intend to pay for it*, let them not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

IDAHO MARBLE.—Mr. R. F. Beale showed us yesterday a specimen of Idaho marble taken from an extensive quarry in Cassia County, near the line of the old stage road, where the same crosses the summit of the Goose Creek Mountains. Mr. Beale, whose long experience in working marble makes him a competent judge in such matters, assures us that this marble is equal, if not superior, to any other yet found on the American Continent. It has a firm, fine texture, and is susceptible of the finest polish. The quarry has been found to extend over an area on the mountain side of one mile in width by four in length. The marble is found in slabs of any required size and of varying widths, from three-fourths of an inch to several feet, and these slabs are found deposited upon another like the leaves of a book, and inclined towards the summit of the mountain at an angle of forty-five degrees. The quarry is easy of access and easily worked; situated within thirty miles of the railroad by the usual route traveled, which crosses Snake River at or near the mouth of Goose Creek. Mr. Beale will have a lot of the marble brought here soon, which he will work into specimens of his handicraft, showing the superior value of the material.—*Idaho Statesman.*

POWDERED ASBESTOS.—M. Erichsen, of Copenhagen, uses powdered asbestos for making a special enamel or coating. The powder is mixed with soluble salts, such as silicate of potash, and mineral or other colors, which combine with the silicic acid, so as to form a product which resists the action of oxygen, heat, cold and moisture. This furnishes a refractory glazing, which protects porous materials, and which can be applied to wood, to gas or water pipes, to brick walls, to constructions of stone or cement, etc., etc. It has been proposed to use it in boilers, to protect the plates against the too great intensity of the fire. When applied to masonry or to wooden objects, the surface is first washed with water and soap. In the preparation of the coating it is only necessary to use the refuse of the asbestos, which would be worthless for any other purpose.—*Chron. Industr.*, Jan. 21, 1883.

San Francisco Metal Market.

(WHOLESALE.

THURSDAY, Dec. 6, 1883.

ANTIMONY—Per pound	14	@	15
IRON—American Pig, soft, ton	30 00	@	—
Scotch Pig, ton	26 00	@	27 50
American White Pig, ton	—	@	—
Oregon Pig, ton	—	@	—
Clipper Gap, Nos. 1 to 4	32 50	@	35 00
Refined Bar	4	@	—
Horseshoes, keg	5 50	@	—
Nail Rod	7½	@	—
Norway, according to thickness	6½	@	7
STEEL—English Cast, lb	16	@	25
Black Diamond, ordinary sizes	14	@	—
Drill	15	@	16
Machinery	12	@	14
COPPER—Ingot	22	@	—
Sheet	31	@	35
Sheeting, Planished, 14x18	22	@	23½
Nails	17	@	—
Bolt	31	@	—
Old	8	@	—
Bar		@	—
Cement, 100 fine	15½	@	—
LEAD—Pig	4½	@	4
Bar	6	@	—
Pipe	7	@	—
Sheet	8	@	—
Shot, discount 10% on 500 bags: Drop, ₱ bag	2 10	@	—
Buck, ₱ bag	2 20	@	—
Chilled, do	2 50	@	—
TIN PLATES—Charcoal	7 55	@	—
Coke	5 50	@	5 75
Banca Tin	25 00	@	—
Australian	25 00	@	—
I. C. Charcoal Roofing, 14x20	6 50	@	6 80
ZINC—By the cask	19	@	—
Sheet, 7x3 ft, 7 to 10 lb, less the cask	90	@	—
NAILS—Assorted sizes	3 30	@	4 75
QUICKSILVER—By the flask	34½	@	—
Flasks, new	1 05	@	—
Flasks, old	85	@	—

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H. S. Berlin, Esq., of the well-known firm of H. S. Berlin & Co., Attorneys, Le Droit Building, Washington, D. C., writes, Dec. 5th, 1881:

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Mining Companies.

Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

REGULAR DIVIDEND NOTICE.

OFFICE OF THE
Standard Consolidated Mining Company.

San Francisco, December 1, 1883.

At a meeting of the Board of Directors of the above named company held this day, Dividend No. 61, of twenty five cents (25c.) per share, was declared, payable on WEDNESDAY, December 12, 1883, at the office in this city, or at the Farmers' Loan and Trust Company, in New York.

WILLIAM WILLIS, Secretary.

OFFICE—Room No. 29, Nevada block, No. 309 Montgomery street, San Francisco, Cal.

EXTRA DIVIDEND NOTICE.

OFFICE OF THE
Standard Consolidated Mining Company.

San Francisco, December 1, 1883.

At a meeting of the Board of Directors of the above named company held this day, an extra dividend (No. 62) of twenty-five cents (25c.) per share was declared, payable on WEDNESDAY, December 12, 1883, at the office in this city, or at the Farmers' Loan and Trust Company in New York.

WILLIAM WILLIS, Secretary.

OFFICE—Room No. 29, Nevada block, No. 309 Montgomery street, San Francisco.

NOTICE OF ASSESSMENT.

The Land Purchasers' Association.—Location of principal place of business, San Francisco, Cal. NOTICE IS HEREBY GIVEN, that at a meeting of the Board of Directors, or Trustees, held on the 5th day December, 1883, an assessment of five dollars ($5.00) per share (being balance of 44th and part of 45th installments) was levied upon the capital stock of this corporation, payable immediately to the Secretary at the office of the Company, 318 Montgomery St., San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 7th day of January, 1884, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on TUESDAY, the 12th day of February, 1884, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors.

EDWARD P. GRAY, Secretary.

OFFICE—318 Montgomery St., San Francisco, Cal.

N. B.—This Assessment is to pay the taxes on the property of the Association for the current year.

ASSESSMENT NOTICE.

Gould and Curry Silver Mining Company.

ASSESSMENT No. 46.

Levied	November 7, 1883
Delinquent	December 12, 1883
Day of sale	January 3, 1884
Amount	Fifty cents per share.

ALFRED K. DURBROW, Secretary.

OFFICE—Room No. 69, Nevada Block, No. 309 Montgomery Street, San Francisco, Cal.

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Our intimate knowledge of the various inventions of this coast, and long practice in patent business, enable us to abundantly satisfy our patrons; and our success and business are constantly increasing.

The shrewdest and most experienced Inventors are found among our most steadfast friends and patrons, who fully appreciate our advantages in bringing valuable inventions to the notice of the public through the columns of our widely circulated, first-class journals—thereby facilitating their introduction, sale and popularity.

Foreign Patents.

In addition to American Patents, we secure, with the assistance of co-operative agents, claims in all foreign countries which grant Patents, including Great Britain, France, Belgium, Prussia, Austria, Baden, Peru, Russia, Spain, British India, Saxony, British Columbia, Canada, Norway, Swedeu, Mexico, Victoria, Brazil, Bavaria, Holland, Denmark, Italy, Portugal, Cuba, Roman States, Wurtemburg, New Zealand, New South Wales, Queensland, Tasmania, Brazil, Now Granada, Chile, Argentine Republic, AND EVERY COUNTRY IN THE WORLD where Pateuts are obtainable.

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Our schedule price for obtaiuiug foreign patents, in all cases, will always be as low, and in some instances lower, than those of any other respousible agency.

We *can and do* get foreign patents for inventors in the Pacific States from two to six months (according to the location of the country) SOONER than other agents.

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Situated so remote from the seat of Government, delays are even more dangerous to the inveutors of the Pacific Coast thau to applicants in the Eastern States. Valuable patents may be lost by extra time consumed in transmitting specifications from Eastern agencies back to this coast for the signature of the inventor.

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We take great pains to preserve secrecy in all confidential matters, aud applicants for patents can rest assured that thoir communications and business transactious will be held strictly confidential by us. Circulars of information to inventors, free.

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Our long experience in obtaining patents for Inventors on this Coast has familiarized us with the character of most of the inventious already patented; hence we are frequently able to save our patrons the cost of a fruitless application by pointing to them the same thing already covered by a patent. We are always free to advise applicants of any knowledge we have of previous applicants which will interfere with their obtaining a patent.

We invite the acquaintance of all parties connected with inventions and patent right business, believing that the mutual conference of legitimate business and professioual men is mutual gain. Parties in doubt in regard to their rights as assignees of patents or purchasers of patented articles, can often receive advice of importance to them from a short call at our office.

Remittances of money, made by individual inventors to the Government, sometimes miscarry, and it has repeatedly happened that applicants have not only lost their money, but their inventions also, from this cause and consequent delay. We hold ourselves responsible for all fees intrusted to our agency.

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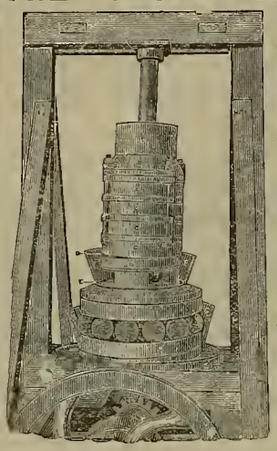
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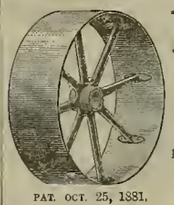
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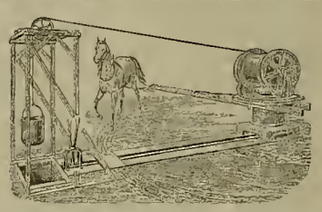
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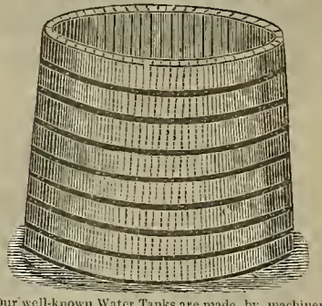


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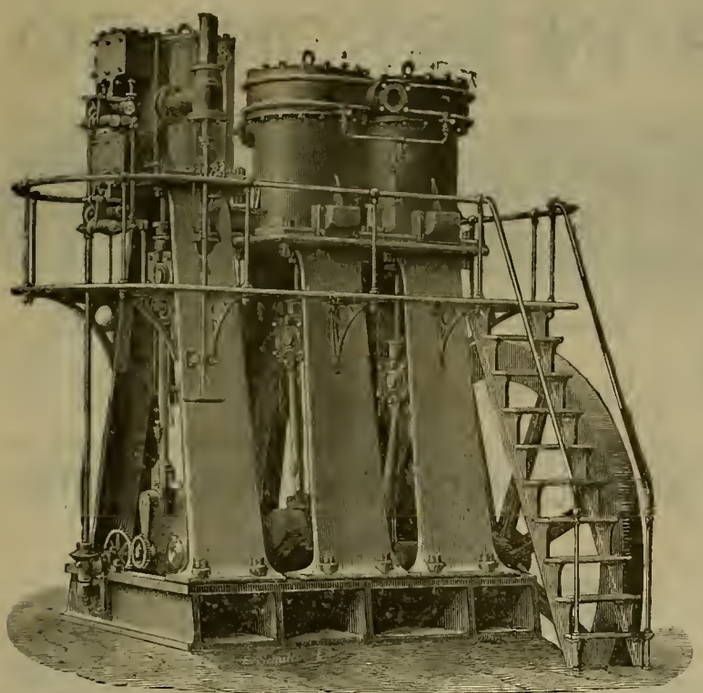
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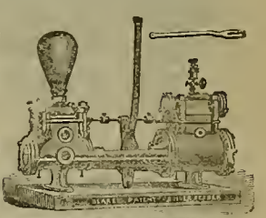


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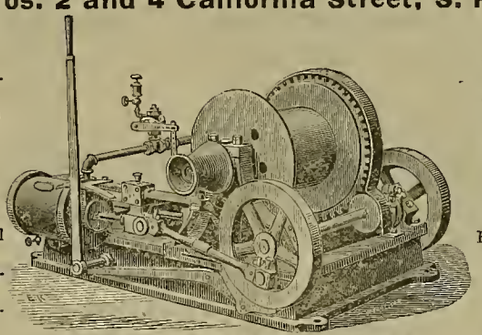


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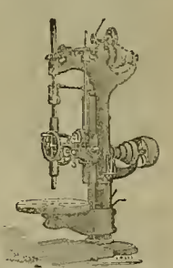




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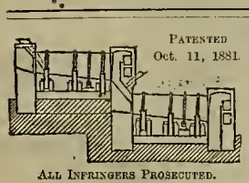
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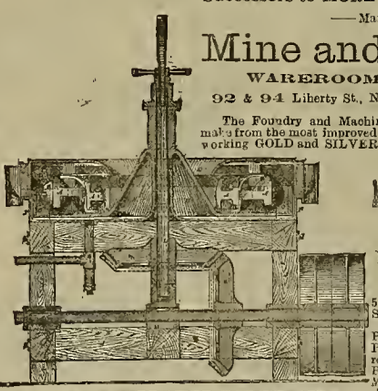
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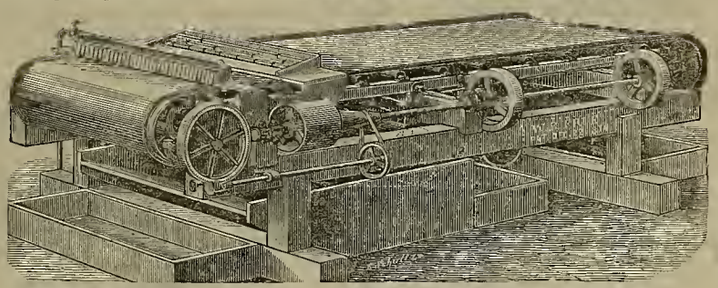
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That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.

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That if there are those who for any reason prefer an end-shake machine, we can manufacture and sell to such machine of that description, as efficient as the Triumph, and at a lower price, and no liability for infringement will then be incurred by the purchaser.

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SAN FRANCISCO, SATURDAY, DECEMBER 15, 1883.

VOLUME XLVII
Number 24.

The Bower-Barff Process—No. 2.

There was commenced a series of experiments with carbonic acid chemically produced by the decomposition of chalk, the idea being that three equivalents of iron would unite with four of carbonic acid, forming one equivalent of magnetic oxide and four of carbonic oxide, if the heat were sufficiently high. The coating was very light in color, pleasing to the eye, but easily removed. This coating, from effects exactly similar and designedly produced by a studied manipulation in the furnaces in successful operation in England, France and here, proves pretty conclusively that carbonic acid, practically pure, produces upon iron, at an elevated temperature, a film which is, in composition, nearer the metallic state than is magnetic oxide. But even supposing that the results obtained by the carbonic acid had been successful as then carried out, the objections referred to concerning the air process would still exist, as external heat and a closed iron muffle would always be necessary. I therefore proposed to use a fuel-gas producer, similar in principle to the Siemens generator, but altered practically to suit other requirements, to burn the combustible gases thus produced with a slight excess of air over and above that actually required for perfect combustion, and to heat and oxidize the iron articles, placed in a suitable brick chamber, by these products of combustion. I also arranged a continuous regenerator of fire-clay tubes underneath the furnace, so that the products of combustion leaving the oxidizing chamber passed outside the tubes, imparting a portion of the waste heat to them, which was taken up by the ingoing cold air passing through their interior on its way to the combustion chamber. I had hoped in this way to be able to so regulate the excess of air over that required for complete combustion as to be able to produce magnetic oxide directly, instead of the lower and useless oxide or combination of oxides produced by carbonic acid alone. I obtained some beautiful results, and some again were unaccountably bad, and I soon found that it was as difficult to regulate the precise amount of oxidation as it first was in the Bessemer process, and I was fortunate enough to hit upon an almost parallel remedy—that is to say, I increased the quantity of free oxygen mixed with the products of combustion, and oxidized the iron articles to excess during a fixed period of generally 40 minutes, when magnetic oxide was formed close to the iron and sesquioxide over all. Then for twenty minutes I closed the air inlet entirely leaving the gas-valve open, and so reduced the outside coating of sesquioxide to magnetic oxide by the reducing action of the combustible gases alone.

The excess of oxygen in the first instance produces sesquioxide of iron, and the under surface of this, being in contact with metallic iron, undergoes reduction to magnetic oxide in the following manner: Four equivalents of sesquioxide unite with one of metallic iron, forming three equivalents of magnetic oxide, or, symbolically (3) $4Fe_2O_3 + Fe = 3Fe_3O_4$. When deoxidizing by combustible gases, consisting mainly of carbonic oxide, three equivalents of sesquioxide unite with one of carbonic oxide and form two equivalents of magnetic oxide and one of carbonic acid, or symbolically (4) $3Fe_2O_3 + CO = 2Fe_3O_4 + CO_2$. Another method of reduction is by carbon itself, when the formula stands thus: (5) $3Fc_2O_3 + C = 2Fe_3O_4 + CO$.

Formula (4) is also the reaction when rusty iron is reduced by producer gases, which consist largely of carbonic oxide, and by the specimens exhibited it will be seen that articles completely pitted with rust may have their surfaces rendered rustless. In this case the periods of oxidizing and deoxidizing are reversed—that is to say, the latter occupies forty and the former twenty minutes. No oxidizing is theoretically necessary, but practically a certain amount is requisite to keep up the heat in the chamber, which of course could not be done unless combustion took place some time or other.

It will be as well, before I make any comparison between Professor Barff's process and the processes patented by my father and myself, to state that the whole of the Professor's patents, wherever existing, have been purchased by my father, so that in this case, at least, I hope you will not say that "comparisons are odious." Professor Barff's process is better than ours for wrought iron, and perhaps for polished work of all kinds, as iron commences to decompose steam at a very low temperature; in fact, much below visible redness. Only the other day at the annual meeting of the Association of American Stove Manufacturers, held in New York, I was asked whether stove patterns might not be made of cast iron, polished and then oxidized. Here is one among many instances where the steam process is almost invaluable. For ordinary cast iron, and especially that quality which contains much carbon, the Barff process is much too slow in its action, and some specimens that I have treated in England have taken as much as thirty-six hours to coat effectually, which could readily have been finished off in five hours by the Bower process.

The main distinction between the two is that the Bower is much more energetic in its action than the Barff process. The carbon in cast iron impedes oxidation, and so, while cast iron is far more readily treated in the Bower furnace, wrought iron is apt to scale unless it is rusted beforehand. The rust then eats into the metallic surface under the influence of heat, and forms a tenacious combination with it. The objection to the use of a closed muffle externally heated, as in the Barff process, has been almost entirely overcome by simply putting wrought iron into a Bower furnace, previously well heated, then shutting off both the gas and air supplies, and admitting steam into the regenerator tubes. The steam thus passes through the red-hot tubes, then through the combination chamber and its contingent passages, already highly heated, over the articles in the oxidizing chamber, heating and oxidizing them, and thence over the outside of the regenerator tubes, depositing a great portion of its heat there before passing to the chimney, and which is again picked up by the ingoing fresh, cooler steam. In this way the heat in the chamber is highest shortly after the commencement of the operation, and gets gradually lower during the time of exposure, which varies according to the class of goods, from five to ten hours. At the close of the operation, just before the articles are taken out, everything is moderately cool, and this for steam is the perfection of action, as stated by Professor Barff himself. Steel, I consider, can be equally well treated by both processes, and, indeed, it is natural to expect this, steel being, so far as the quantity of carbon it contains is concerned, between cast and wrought iron. Polished steel, however, is better treated in a low-temperature Barff furnace.

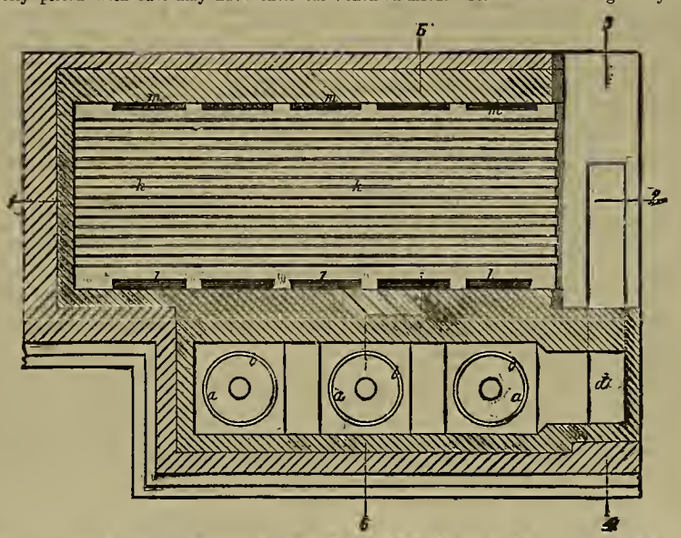


Fig. 3.—HORIZONTAL SECTION, BOWER-BARFF FURNACE, ALONG LINE 7.

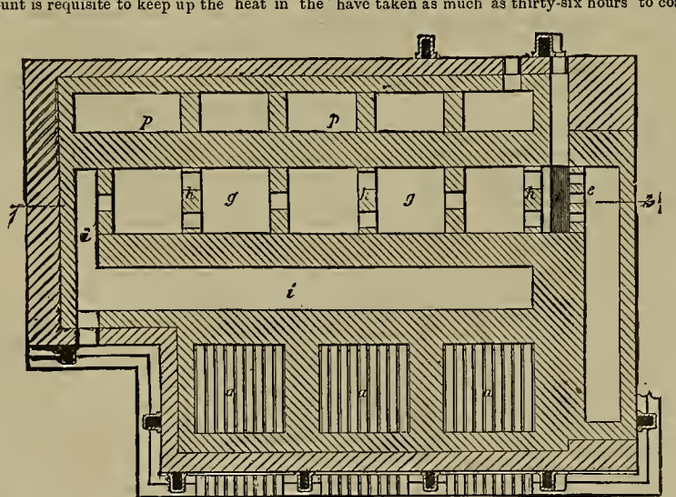


Fig. 4.—HORIZONTAL SECTION, BOWER-BARFF FURNACE, ALONG LINE 9-10.

With regard to the quality of fuel burned in the gas producers, a non-coking gas coal is the best, and Virginia splint has suited very well in this country, and of this about 1 ton every three days is required for a furnace with an oxidizing chamber 13 feet long, 4 feet 3 inches wide and 4 feet 3 inches high. When a gas coal is employed, it should be fed through the charging hoppers just before each deoxidizing operation, when a smoky flame is of great advantage. I have, however, discovered that anthracite can be used as well as a gas coal by simply allowing petroleum to drop at the rate of one gallon per hour upon the red hot surface of the coal in one of the gas producers.

The engravings on this page show two more views of the furnace in addition to those we gave last week. The figures—3 and 4—are horizontal sections taken along the lines 7-8 and 9-10, of the engraving shown last week. The same description applies, viz: The hopper supplies the producers for gasifying the fuel. The carbonic oxide from the combustion of fuel in the producers, passes along a conduit d (its flow being controlled by a slide c), to the openings e, where this combustible gas meets a current of hot air ascending through a passage f, and is consumed. The products of combustion are thence conducted along a passage g, where they are thoroughly mixed by open brick-work cross walls h, and then return along a passage i, whence they enter, through the oblong holes l, the chamber k, in which the articles to be coated are arranged. After having passed over and among the articles to be coated, the waste escapes downward through ports m, into regenerator chambers p, and thence to the chimney flue, heating in its passage the tubes t, composing the regenerator.

The coal fields bordering on the Teanaway, says the Kittitas, W. T., *Localizer*, bid fair to develop into something valuable. The coal is said to be a very superior quality of bituminous, and is of a shining jet color, and makes an excellent flame. Its proximity to the Northern Pacific railroad survey adds value to the find, either for the company or for shipment.

CORRESPONDENCE.

The After-Glow.

The Phenomenon in the Western Heavens.

EDITORS PRESS:—Many of the newspapers of this coast have recently referred to an unusual phenomenon noticeable in the western heavens for an hour or an hour and a half after sunset—luminousness often extending to the zenith and lighting up the whole sky, particularly to the south and southeast. The greatest brilliancy is always a little to the south of west, within twenty degrees of the horizon. It often appears like the reflection of a great conflagration at a distance, and frequently exhibits every shade of yellow, from a light straw color to burnished gold. The writer first noticed this after-glow some time in the latter part of September or first of October, when it was quite faint in the west near the horizon, but it has been gradually growing brighter, and continues longer than at first.

During the fall months and latter part of summer the atmosphere was quite hazy, as in Indian-summer weather, and it seemed when the brightness alluded to began to be observable that this peculiar, smoky condition was in some way related to it. But now, it appears, such is not the case. The haziness was most noticeable at the time, and before the first appearance of this luminous reflection in the west, and during the last two weeks has almost entirely disappeared; whereas, the after-glow has been growing brighter.

This Strange Phenomenon,

Which has been remarked from southern Arizona as far north as Oregon, and eastward to Nevada and western Texas, is ascribed to various causes—increased density of the atmosphere, the effect of heavy sand storms, etc. But as it has been observed in the Hawaiian Islands, by crews of vessels in the Pacific, at a great distance from land, and even in Europe, —it is not probable that it can be attributed to local causes. If it were due to a greater humidity it would not continue so long at this season of the year, when the temperature is subject to sudden and great changes; nor is it likely that it would reach the great height above the earth's surface that this ethereal substance evidently does, as is clearly proven after sunset by the appearance of a bright reddish or yellowish light far above the uppermost stratum of clouds. It is impossible that sand storms, which are infrequent, circumscribed in extent, and never of long duration, should exert a like influence, and for so long a time. It is nothing of an ordinary nature that produces this brilliancy, for it matters not whether the evening be warm or cold, or whether the sky be perfectly clear or partially flecked with clouds, the after-glow is visible at the usual time.

In the humble opinion of the writer the most plausible theory yet advanced regarding this peculiar phenomenon is that it is caused by a

Finely Divided Volcanic Dust,

Or gaseous vapor from the great eruption in Java, which broke out August 26th. It might be objected in the first place that the air currents would not transport this material to so great a distance; but several instances have been cited of volcanic dust, ejected by lesser eruptions than that of August last, being carried thousands of miles. Prof. Judd, in his excellent work on "Volcanoes" (page 72), says: "It is not an unusual circumstance for vessels at sea to encounter at great distances from land falling showers of volcanic dust. We sometimes meet with this far-traveled volcanic dust under very unexpected circumstances. Thus, in the spring of 1875 I had occasion to visit Prof. Von Rath, of Bonn, who showed me a quantity of fine volcanic dust which had during the past winter fallen in considerable quantities in certain parts of Norway. This dust, upon microscopic examination, proved to be so similar to what was known to be frequently ejected from the Icelandic volcanoes that a strong presumption was raised that volcanic outbursts had been going on in that island. On returning to England I found that the first steamer of the season had arrived at Leith from Iceland, bringing the intelligence that very violent eruptions had taken place during the preceding month."

The master of the bark *John M. Clerk*, which arrived at Honolulu in November, 1880, from Hongkong, reported that on the 10th of October the decks of the vessel were covered with ashes from a volcano on one of the southern islands of Japan. A phial of these "ashes" shown to the writer resembled the substance erroneously termed "black sand," which underlies the surface soil of Oahu, and probably other islands of the Hawaiian group.

Mr. S. E. Bishop, of the Hawaiian Survey Department, communicates to the Honolulu *Saturday Press*, of September 22d, the following regarding the after-glow: "I first noticed

These Peculiar Appearances

On the 5th inst, at 7 P. M.—so long after sunset that ordinarily no trace of color remains on the western sky. The sky from southwest to west was then covered with a lurid red and dull yellow glow, much resembling that produced by a distant conflagration. This extended to an altitude of 15 or 20 degrees. Something of the same was also distinguishable in the eastern sky. I continued to distinguish this light until 7:25. Mr. J. F. Brown says that he observed it until 7:45. After 7:25 I was otherwise engaged.

"I would note three peculiarities of this phenomenon, distinguishing it from ordinary sunset reflections, and unlike anything I remember to have observed before. First—It appears to be a reflection from no cloud or stratum of vapor whatever. An undefinable haze might, perhaps, be fancied to be the medium reflecting sunlight. Second—The peculiar glow, as of a distant conflagration, totally unlike our common sunsets. Third—The very late hour to which the light was observable—long past the usual hour of total cessation of twilight. To these may be added a fourth peculiarity—that the center of brilliancy was more or less to the south of west."

"I am disposed to conjecture that some very light element among the vapors of the Java eruptions has continued at a very great hight in the atmosphere, and been borne by the upper currents across the Pacific into this region. The best evidence of the surmised connection with those eruptions would be the tracing of an increased appearance of these phenomena westward across the Pacific. * * * It will be interesting, also, to trace the extent of this phenomenon to the eastward. Has it been perceptible in California?"

In the same paper of October 13th, he says: "During the past two weeks the haze stratum has developed more definiteness of form. In certain conditions of sunset light it has been distinctly visible as a continuous sheet over the entire sky, at a hight far above that of the highest cirrus clouds. A slight wavy ripple has been very noticeable in its structure. It has always been perfectly transparent, transmitting the light of the smallest stars, and itself invisible, except in particular conditions of the sunlight. During several days it has formed a conspicuous circle of fifteen to twenty degrees radius against the sun, appearing as a misty rippled surface of haze with faint crimson hue, which at the edges of the circle gave a purplish tint against the blue sky.

"So the evidence favors a remote source of this vapor. It seems impossible that our own volcanoes could, unobserved, have emitted such vast quantities of pure tenuous gases, unmixed with coarser smoke. * * * The theory of a remote origin seems also to be favored by the long continuance of a very nearly uniform condition of this base stratum. A local smoke would have rapidly varied its condition. This has lasted now for four weeks, with little alteration in structure.

"It seems to answer well to the character of a tenuous, delicate residuum of volcanic smoke, completely purged of all its coarser elements by a kind of levigation in its course through the upper atmosphere across the Pacific. It is most significant that it was first observed nine days after the Java eruptions. * * * Captain Penhallou, of the *Hope*, definitely observed these same phenomena in latitude 24° 06" N., and longitude 140° 29" W., on September 18th, midway between this and the American coast."

Thus it appears that these phenomenal

Reflections of the Solar Light

Were first noticed in the islands nine days after the breaking out of the eruption in Java, and several days before they became visible in California, which would be the case if the above theory of the origin of this vapor or other subtile material be the correct one. The greatest brilliancy there, as here, is noticeable to the south of west, which tends to prove a remote south-westerly origin. If this matter were evenly distributed through the atmosphere, the reflection would naturally be brightest in the track of the setting sun.

Since Mr. Bishop first observed the after-glow in Honolulu the following appeared in the London *Times:*

"A greenish tint has lately been visible round the sun. Several explanations have been put forward, of which the most plausible appears to be that offered by the government astronomer, that it is due to the passage across the south of India, of clouds of sulphurous vapor from the Java volcanoes." Here is further evidence in proof of this theory. Java being in the region of the equatorial calms the lighter particles of water thrown out by the late eruption, which must have been carried many thousand feet above the earth's surface by the force of the ejectment and by the ascending current of rarefied air caused by the intense heat of the volcanic fires, must have been widely distributed over both the northern and southern hemispheres, the direction of the upper atmospheric currents between the tropics being north and south from the equator. These after-twilight reflections have been reported from Australia, and from the above paragraph quoted, it is evident that a portion of this tenuous volcanic dust or vapor has been borne westward, as well as eastward to our shores.

The "greenish tint" referred to by the *Times* has also been noticeable here; and on the evening of Nov. 30th, for the space of fifteen minutes, the entire reflection was of that same tinge, varying from a dull, murky green on the southwestern horizon to the faintest resemblance to that color beyond the zenith toward the east. This was also noticeable last evening—Dec. 5th—for about five minutes. The sky was more than half overcast with cirrus and cirrostratus clouds, but above them this greenish hue was discernible.

The Honolulu *Press* says editorially of these phenomena: "Perhaps the only really plausible theory yet offered is that of Mr. Serano Bishop * * where he seeks to connect it with the volcanic outbreak in Java. * * There is this fact, however, which seems to bear against it: That while we have had many and large eruptions on Hawaii, with immense lava flows, the reflected light from which has often been seen from Maui and Oahu in the direction of the volcano, no effect has ever been visible, so far as the writer is aware, in any way approaching the nature of the cosmic appearances lately seen."

The Hawaiian Volcanoes.

Are unlike all other large ones that have been most observed, and the character of their eruptions is different. No others discharge such great quantities of lava nor emit so intense a heat. Other volcanoes usually eject vast volumes of ashes, cinders, rock and dense clouds of smoke, whereas the only instance of any considerable shower of ashes and fragments of pumice stone from Mauna Loa was in March, 1868, when the surrounding country for many miles was covered several inches deep. During the last eruption from that mountain, which commenced November 5, 1880, the heat was so great that no heavy masses of clouds gathered on the side where there is usually the greatest precipitations, until the outbreak had spent its fury, and for two months very little rain fell at Hilo, a place proverbial for its heavy rainfall. During the months of November and December of that year the precipitation measured only 5.49 inches. During the same months in the following year it amounted to 52.18 inches.

During this eruption, which continued nine months, only once, for a period of three or four days, was there an appreciable haziness noticeable in the atmosphere at Honolulu, 180 geographical miles northwest, and to the leeward of the volcano, and this was during a cessation of the usually prevalent trade wind. Probably this haziness would have been more frequent had not the eruption quieted down during the months when southerly breezes are most common. It was noticeable also that the mineral smoke from the source of the lava flow bore a small proportion to that caused by the burning vegetation in the dense forests through which the burning river forced its way. No where else do

Lava Fountains

Play to so great a hight and in the same manner as on Mauna Loa. Elsewhere columns of volcanic debris are thrown into the air and frequently fragments are scattered for miles around. During the eruption of 1880-81, a lava fountain, variously estimated at 800 to 1,000 feet in hight, ascended from the crater at the source. Rev. Titus Coan, an unimpeachable authority, in his work, "Life in Hawaii" (p. 280), speaking of the eruption of 1852, says: "On the 20th (Feb.) the eruption broke out laterally, about 4,000 feet below the summit; * * from this aperture a brilliant column of fire shot up to a hight of 700 feet, by angular measurement, with a diameter of 100 to 300 feet. This lava fountain was sustained without intermission for twenty days and nights."

On the principle that where there is much fire there is little smoke, one would think, naturally, that there would be a limited quantity of fine volcanic particles of any description to be transported to great distances from these eruptions by the air currents; and, if any, it would be borne to the eastward of Honolulu. On careful consideration it can not be conceded that the absence of similar phenomena in Honolulu to those now visible after sunset, on the occasion of Hawaiian volcanic eruptions, "bear against" the theory of a Javan origin.

Usually, the Volcanic Cloud

Is most dense over the lava flows during Hawaiian eruptions when, as previously stated, the liquid fusion has reached the forests, and also when the lava stream pours into the sea immense clouds of steam then mingling with the smoke of the burning vegetation. But that other substances than smoke and steam are contained in the clouds rising from the crater and lava streams and fill the air for a great distance on the leeward side is proved by the deadly gases impregnating the atmosphere, to breathe which is certain death.

The edge of the lava stream, however, may be approached on the windward side with safety. The following excerpts from Coan's "Life in Hawaii" (p. 284), will show that the amount of debris usually thrown off during eruptions in that island is small when compared with large volcanoes elsewhere, although the lava discharge is greater. Speaking of his approach to the source crater of the eruption of 1852, in which a lava fountain was playing, he says: "The heat was so intense that I could not approach the pillar within forty or fifty yards, even on the windward side. * * * On the leeward side the steam, the hot cinders, ashes and burning pumice forbade approach within a mile or more."

The eruption from Mauna Loa in 1868 was an exceptional one in many particulars, and the atmosphere about the group for a few days was very hazy, probably too much so to admit of any such display as that now visible. In the appendix to Jarves' "History of the Hawaiian Islands" (p. 235), occurs the following paragraph in the account of this eruption:

"The quantity of lava thrown out has not probably been one-tenth what was discharged in 1859, but the quantity of steam, gas and smoke emitted during one week, must have exceeded what escaped during ten weeks in 1859, when the volume of smoke was comparatively small. We judge so from its density over all the group, and for a thousand miles off. This has not occurred in any late previous eruption to the same extent. The inference, therefore, may be drawn that when an unusual quantity of smoke escapes, a less amount of lava will be discharged; and *vice versa* when the the quantity of smoke is small, the amount of lava is increased." This agrees with the statement before made, that the quantity of other material than molten lava commonly emitted during the Hawaiian eruptions is comparatively insignificant. It must be remembered also that the

Late Eruption in Java

Was the severest ever chronicled, and that the vast quantity of matter ejected is without precedent. The only one approaching it in severity was the disastrous eruption of 1772 in the same island. Speaking of this outbreak, Judd, in his book on "Volcanoes" (page 169), says: "This is perhaps the most violent and terrible that has happened within the historical period. A lofty volcanic cone, called Papandayang, 9,000 feet high, burst into eruption, and in a single night 30,000,000,000 cubic feet of materials were thrown into the atmosphere, falling upon the country around the mountain, where no less than forty villages were buried. After the eruption the volcano was found to have been reduced in hight from 9,000 to 5,000 feet, and to present a vast crater in its midst, which had been formed by the ejection of the enormous mass of materials."

Another account of this eruption says that "in a single night such an immense quantity of scoria and ashes was thrown out that an area having a radius of seven miles was covered with a layer fifty feet thick."

The Javan eruptions have always been noted for discharging vast quantities of material. "In October, 1822," says one account, "at midday, under a cloudless sky, without any premonitory warning, a dark, dense mass suddenly rose from the mountain of Galunggong, a short distance east of Papandayang, and spread itself out with such appalling rapidity that in a few moments the whole landscape was shrouded in the darkness of night." In 1843 Mt. Guntuo, in the same island, flung forth ashes, cinders, etc., to the extent of 20,000,000 tons. Older records, although there is no means of verifying them, being traditional only, tell of other disastrous volcanic outbursts, accompanied by severe earthquake shocks.

For accounts of the late eruption we have, as yet, to depend on the telegraphic dispatches to the newspapers; but they are sufficient to enable us to form an idea of its severity, although they may not be correct in every particular. From these the following are condensed:

"The Outburst

Took place on the 26th of August, accompanied by shocks of earthquakes and tidal waves. The sides of the great volcano Krakatoa were blown out into the sea, and the whole island on which it was situated entirely disappeared. Stones and volcanic matter were hurled a distance of two and three hundred miles. The captain of a steamer in the straits of Lunda reports that ashes fell on the decks of his vessel to the depth of eighteen inches, and that he passed masses of floating pumice stone seven feet deep. The next day sixteen active volcanoes rose out of the sea between the site of the island of Krakatoa and Sihisie Island, and almost directly over the site of Mersk and Middle islands, which had disappeared beneath the waves. An extensive plain of volcanic stone was formed in the sea near Sampong, Sumatra. Much of the low land along the coast was swept by tidal waves, and smaller islands were totally or partially inundated.

On the 27th the craters of Papandayang began to discharge great masses of destructive matter, but without the force of the former action. Three distinct columns of flame were seen to rise from the mountain to a vast hight. Stones fell for many miles around, and the black fragmentary matter that was carried into the air caused total darkness. Suddenly the scene changed—the mountain was split into seven parts without a moment's warning, and as many peaks rose to a great hight where before Papandayang stood alone. From the fissures poured clouds of steam, and the black ejected lapilli flowed in a steady stream down the mountain-side. The exhalations of carbonic-acid gas were so abundant that fowls and animals and a few human beings were killed by it. The total loss of life during the eruption is estimated at 75,000 to 100,000 souls.

"Previous to the rending of the mountain," says one account, "the rise of vapor produced the appearance of a column several thousand feet high, based on the edge of the crater. It appeared from a distance to consist of a mass of innumerable globular clouds of extreme whiteness, resembling vast balls of cotton rolling one over the other as they ascended, impelled by the pressure of fresh supplies, urged upward by the explosions. At a great hight the column dilated horizontally and spread into dark and turbid circles. The cloud was shaped like an immense umbrella."

These quotations from the newspapers give us some idea of the force of the outburst and of the

Enormous Quantity of Material Thrown Out.

The volcanic cloud, which arose to a hight of many thousand feet, caused "total darkness," as was the case in the eruption of 1822. If the outbreak from Mauna Loa in 1868, which was

(CONCLUDED ON PAGE 382.)

MECHANICAL PROGRESS.

Grinding and Polishing Metal Surfaces by Hand.

There is no job the worker in metals is called upon to do that requires the exercise of his brain and muscle in the proper direction more than the grinding and polishing of metal surfaces on that class of work where machinery can not aid him. The more he exercises his brain, the more saving he will be both of his time and muscle. The practice generally employed by machinists in grinding and polishing either new or old work is to mix the polishing material with oil, usually refuse machinery oil; in most cases this is a great mistake, and has caused the loss of time, patience and money.

Take, for instance, the grinding to a true bearing of a stop cock, a valve seat or a slide valve. There are few machinists but what have had more or less of that class of work to do, particularly in jobbing shops, and we seldom find one who uses the same method of accomplishing the job that is practiced in shops where that class of work is made a specialty. In fitting and grinding the plug into the barrel of a cock, a little judgment and care will save a great deal of hard labor, and in no case should oil be mixed with any of the grinding material, for the following reasons: If fine emery, ground glass, or sand are used with oil, it requires but a few turns of the plug in the barrel to break up the grains of the grinding material into very fine particles; the metal surfaces also grind off, and the fine particles of metal mixing in with the grinding material and oil make a thick paste of the mass. At this stage it is impossible to grind or bring the metal surfaces to a bearing, as the gluey paste keeps the metal apart; if more grinding stuff is applied it will prevent the operator from seeing what part of the barrel and plug bears the hardest.

Again, if the grinding material be distributed over the whole surface, the parts that do not bear will grind off as fast as the parts that touch hard, as the particles work freely between the surfaces; should the barrel and plug bear equally all over when fitted, it requires more care than if it were a top or bottom bearing, as that part of the barrel and plug across the "waterway" grinds twice as fast as the other parts, therefore it should be kept the driest. Now this objection holds good in the grinding of valve seats or slide valves, to wit: the separation of the surfaces of the metal by a thick, pasty grinding material. In order to bring the surfaces to a perfect bearing rapidly and with little labor, the following directions will be found worth a trial:

To grind a stop cock of any kind, first see that the plug fits the barrel before it is taken from the lathe. Run a half-round smooth file up and down the barrel, to break any rings that may be in it; a few rubs of a smooth file back and forth over the plug will break any rings or tool marks on it. Wipe both parts clean. Use for grinding material fine molders' sand, sifted through a fine sieve. Mix with water in a cup, and apply a small quantity to the parts that bear the hardest. Turn rapidly, pressing gently every few turns; if the work is large and the lathe is used, run slowly; press, and pull back rapidly to prevent sticking or ringing; apply grinding sand and water until a bearing shows on another part; then use no more new sand, but spread the old that has worked out over the whole surface. Turn rapidly, pressing gently while turning; withdraw the plug and wipe part of the dirt off, and rub on the place a little brown soap; moisten with water, and press the surfaces together with all the force at hand, turning at the same time. Remove the plug and wipe both parts clean; next try the condition of the bearing by pressing the dry surfaces together with great force. If the parts have been kept closely together while grinding, and the plug has not rubbed against the lower part of the barrel, the surfaces will be found bright all over and a perfect bearing obtained. If an iron barrel and a brass plug are used, or two kinds of brass, a hard and soft metal, soap should be used freely in finishing up, as the tendency to form rings is greater when two different metals are used.

In grinding a slide valve which has been in use until hollow places have worn in the surface, emery mixed with water, or sand and water, will be found better than oil, unless a light body of oil, such as kerosene, is used. If water is used with the grinding material, soap should be rubbed on hollow places, and the grinding stuff should be applied to the high parts in small quantities, keeping the low parts clean and dry until an even surface is obtained all over; then the worn-out stuff should be used for finishing up. In polishing metal, oil that will "gum up" should not be used with the polishing material unless for a dead-fine polish. In polishing old brass work which has been scratched and tarnished by wear, pumice stone or bath-brick should be used with soap and water for scouring off with, and rotten-stone with kerosene oil for the wet finish, and dry for the final polish.' The same method should be used for new brass work.

New work should require, after leaving the lathe and vice tools, but little polishing or grinding, and every good workman should try to avoid using an emery stick or emery cloth, as with proper care in the use of tools a great deal of grinding and polishing can be dispensed with.—*American Machinist.*

STARTING FIRES.—Edwards, in his "Catechism of the Marine Engine," gives the following as the best way to start fires: Before proceeding to start the fire, you must see that the man and the hand hole plates are put on (if they have been taken off for cleaning out or repairs) and the joints properly made. If the boiler is new, or in good order, a gum gasket is all that is required to make them tight, but if the boiler is old and worn about the handholes, it will be necessary to put two or three turns of lamp wick around the gasket, smearing it with white lead. After the plates are all on, fill your boiler with water until the glass gauge is half full, then cover your grate bars all over with coal, and put in two or three layers of cordwood (pine is the best). Then take some shavings, split-wood, or oily waste, place it over and about the wood next to the door, and light it, keeping the furnace door open and the ash-pan door shut (if there be one) until the wood is thoroughly ignited, and then, and not until then, shut the furnace door (and open the ash-pan door if there be one) and cover the wood with coal, adding to it as fast as the wood burns away; in a short time you will have a splendid fire. Steam can be raised a half hour sooner in this way than by the common method of putting the wood on the bare grate-bars.

STRAINS ON IRON AND STEEL.—The various tests which have been made with a view to determine, if possible, the effect of percussion on iron and steel, show some interesting results. In some recent experiments of this kind in England, square pieces of iron and steel boiler plates were used for the purpose, the former being seven-sixteenths of an inch thick, and the latter three-eighths, a charge of one and one-half pounds of gun-cotton being used in each experiment. The plates were laid over, respectively, a basin-like cavity in the top of a large block of iron, and the gun-cotton was exploded over the center, at a hight of about nine inches. The outcome of these experiments proved that the mild steel plates of the Siemens and Bessemer processes, tempered in oil, possess an endurance and ductility far beyond what have been known to characterize British wrought irons, and that steel possesses certain positive advantages over iron, in the manufacture of boilers, locomotive tires or rails.

TIGHTENING PULLEYS.—The tightening pulley is applied to belts for increasing their adhesion to the pulleys; and as this is liable to fail first on the smaller pulley, it is usual to place them on the slack side of the belt, nearer this pulley, in order to increase adhesion as well as the area of contact, which it effectually does in this position; but it also increases the friction of driving, in proportion to the thrusting of the same from the line of its natural curvature. If placed nearest the larger pulley, it would increase the adhesion where such is not wanted, and would, at the same time, diminish the area of contact on the smaller pulley by pulling the belt away from it, thus lessening the very effect which it was applied to remedy. It would, however, increase adhesion by augmenting the tension of the belt; but this in turn would add to the resistance to be overcome, by creating additional friction in the shaft bearings.—*Cooper on Belting.*

STICKING A KNIFE THROUGH A BOILER.—A feature of the recent inquest concerning the "Riverdale" steamboat explosion, which would be amusing if there was not a tragic side to the matter, was the testimony of the first engineer, that on looking over the boiler, a small quantity of salt on the covering revealed the presence of a leak; and that after cutting through the lagging he found the shell so corroded by salt that he could thrust his knife through the iron. This corrosion was of such a character that it was bounded sharply by iron of substantially the original thickness. This shows that those classes of feltings which cannot be readily removed for the external inspection of the shell are dangerous, because they do not at once and readily show the presence of such leaks and corrosions.—*Journal of R. W. Appliances.*

A GRINDING MACHINE for producing the relief on twist and fluted drills has been invented by Henry F. Wheeler, Leominster, Mass. The cross-pin of the reciprocating rod travels in a spiral groove in the rotating sleeve, and in a straight groove in the spindle which carries the drill, and this gives the spindle and drill a rotation independent of the sleeve, which causes them to turn at a different speed from that of the sleeve, whereby the proper relation between the part of the drill in contact with the grinder and the part of the cam in contact with the friction-roller is produced.

A HINT TO MANUFACTURERS.—The *Northern Tier*, Crookston, Minn., says: "One of the impositions which farmers are subjected to by manufacturers, is putting up their machines, plows, etc., with round bolts having round heads. Often in plows of noted patterns the bolts are round with round heads, fitting a counter-sunk hole, and the only way to tighten them is to cut the nuts off with a cold chisel and replace with new bolts. Many wagons and machines are open to the same objection, which is certainly a very serious one and should be remedied."

SCIENTIFIC PROGRESS.

Evolution.

An eminent writer pitches into the advocates of evolution who have been making such a stir during the last few years, after the following fashion:

It is amusing, perhaps more so than folly ought to be, to see an ignoramus stand up and prate over evolution. It does not disturb him to be reminded that nature seems to have gone out of the business of evolution. That is nothing. He can trace anything backward, the horse to the time when he was five-toed, and the five-toed back to when he was web-footed, and the web-foot back to fins. But it is a sad thought that all upward progress has ceased. Evolution has ceased to evolute. Engravings of wheat and cattle and men found on the pyramids prove to us that none of these have changed. Four thousand years have gone by, and the first specimen of a better man does not appear. There is no sixth sense, or third eye, or winged shoulders, or telescopic eye—nothing to show that we are links in the progression upwards.

Nature has no longer a laboratory or a pattern shop, in which she is evolving better forms of anything. There is no such thing as a plant or a grain or a tree leaving off some of its habits and taking on new ones, so as to become a different order of things. Strawberries are not approaching the size of watermelons. The fox, unmolested by traps and chains, is free to develop into something better, but he does not incline. The fact is, that which was built a ferry-boat remains a ferry-boat, and what was built Great Eastern will always be Great Eastern; and it is just as true that elephants never lose their trunks, nor essay to carry more than one; the wild horse never affects a horn, nor do wild cattle abandon the fashion of two. The schools of mackerel never graduate whales. Catastrophies have occurred in which the lives of thousands of species have suddenly been arrested, and the bodies of many have been preserved in stone. The surprise never yet overtook a creature that was on its way up higher into a new and unknown species, nor do existing forms give any signs that they tend to invent new and untried organs. Neither is there any such thing conceivable that we can trace backward through the successive links of the progress of a species, without coming, at last, to the first link, which had no predecessor, and which could not have created itself. The whole system of evolution is without facts or even analogies to support it. Its wisest supporters are cautious not to make assertions. They say, May it not be so? It is reasonable to suppose, etc. All true science is based on facts; evolution is not so based, and it has no claims to be a science.

A VACUUM A GOOD CONDUCTOR.—Professor Edland has communicated an important paper to the Royal Academy of Science, Sweden, in which he adduces further proof of his discovery that a perfect vacuum is a good conductor of electricity. This result is directly opposed to the current doctrine that a vacuum is a perfect insulator. The reason why a Torricellian vacuum is not traversed by an electric current is due to the fact that there exists at the points of the electrodes an obstacle to the discharge of the current, and this obstacle is augmented as the air is rarefied. If the current could be introduced into the vacuum without electrodes, it would be able to pass through the void without difficulty. The conclusion he arrives at from his recent elaborate experiments is that the maximum attained by the current intensity at a certain pressure of the air when a current traverses a rarefied air space is not due in any way, as generally assumed, to the resistance between the electrodes by the air having its minimum at that pressure, and afterward increasing in amount with the increase of rarefaction, but to the fact that the sum of the electromotive of the spark and this resistance then possesses its minimum value. With the continuation of the rarefaction the resistance of the column of gas diminishes; but the electromotive force increases. Without employing electrodes at all, M. Edland can, by induction, easily excite luminous effects in a gas sufficiently rarefied to stop the passage of a powerful current from electrodes. But this would in his opinion be impossible if a highly rarefied gas were an insulator.

PHOTOGRAPHY OF MOVING OBJECTS.—The dry-plate process and special arrangement of the camera, by which exceedingly brief exposures are possible, have enabled the photographer to take views of rapidly moving objects. With particularly sensitive plates some startling results may be obtained, and not only can moving animals and vessels be photographed, but the spokes of the wheel and the fast trotter can be shown with sharp and distinct outlines. Even views from the windows of a quick train can be obtained. The necessary time of exposure has been reduced to such a small fraction of a second that absolute steadiness of the camera itself no longer enters into the problem. The dry plates are gradually driving out the wet ones in the galleries, and those who pose in uncomfortable positions are no longer in danger of being tired out. The artist no longer finds it essential to tell his patrons to "look pleasant," but he aims to tell them something interesting, when the natural expression comes over the face, and is instantly caught by the camera. The taking of the baby's picture is no longer accompanied by dread. Much of the best work done with the dry-plate process has been by amateurs.—*Scientific American.*

PHOTOGRAPHING THE SOLAR CORONA WITHOUT AN ECLIPSE.—Dr. Huggins has continued his experiments on this subject during the past season. He has made use of a fine seven-and-a-quarter-inch speculum by the late Mr. Lassell. Three inches and a quarter of the central portion only are employed, the light being received a little obliquely, so as to throw the image to one side, as in the Herschellian telescope, thus avoiding a second reflection. The absorbent screens of potassic permanganate, or blue pot-glass, have been dispensed with, and an emulsion, prepared specially for the purpose by Captain Abney, and containing only chloride of silver, has been generally used for the sensitive plate. Between April 2d and September 4th, fifty plates have been exposed on fifteen different days; and all of them are said to show a more or less distinct coronal appearance around the sun.

The plates have been put into the hands of Mr. Wesley, the celebrated engraver, who made the magnificent plates of Mr. Ranyard's Eclipse volume; and he has prepared for each day a drawing of what he could make out on all the plates taken on that day.

Four drawings were presented, each of them showing incontestibly details belonging to the lower portion of the corona. The paper was presented to the British association.

MAGNETIC RAILS.—A well informed trade contemporary says: "A professor of the Faculty of Sciences of Marseilles, together with two permanent way engineers of the Paris-Lyons-Mediterannee Line, has just made some curious experiments on the rails laid between Marseilles and Rognac. They have ascertained that all the rails that have been laid some time have been transformed as to their two extremities into powerful magnets, capable of attracting and holding iron kegs and even stronger articles. If the rails he raised they keep their magnetism for some time, but gradually lose it. Two poles are formed at the corresponding ends of two rails of opposite sign. The production of magnetism in the rails in use is to be explained by the friction resulting from the running of cars on the track. It is certain that the magnetism thus developed exerts a useful influence on the stability of the track, and increases the hold of the wheels on the rails." Without contesting the fact itself, which does not appear very surprising to us, we should be glad to know how far this magnetism can increase the hold of the wheels, which in a locomotive often carry four to six tons each, above all when the rails are placed end to end, and mutually destroy one another's magnetism.—*L'Electricien.*

LATEST FROM THE LICK TELESCOPE.—The trustees of the James Lick trust have received a communication from A. Clark & Sons, of Cambridgeport, inclosing an extract from the communication of Mr. Fiel, who has been molding the crown glass of the Lick telescope, in which he says: "Since the disk has been taken from the furnace, I have been obliged to put it back again after cutting out some soda. This operation has been done successfully, and I hope to take it from the furnace in fifteen days, and it will take about fifteen days to polish it, and it is probable that I shall be able to send it to you in the first days of December." The flint glass of the great achromatic objective was successfully cast a long time ago, and has been for many months in the the hands of the Clarks awaiting the receipt of the crown disk. The latter is much the most difficult to cast, anneal and polish, owing solely, it is believed, to the inexperience of the manufacturers with such great masses of glass. Never was such a casting attempted until the Lick telescope was contracted for. It was at one time supposed that the limit of achromatic objectives had been reached when the Washington telescope, twenty-six inches in diameter, was made.

NITRIFICATION IN THE SOIL.—Nitrification is dependent on the presence of oxygen, and Schlosing has shown that a diminution of the amount of oxygen present decreases the rapidity of the change. Such a diminution of the amount of oxygen in the soil is effected by the presence of organic matter, which unites with it, forming carbonic acid, and thus acts, as Deherain and Maguenne point out, to moderate the rapidity of nitrification, and so to prevent a loss of nitrates in the drainage water. The same authors explain in this way the greater richness in nitrogen of untilled land, and claim that the presence of organic matter is necessary in order that the soil shall gain nitrogen from natural sources.

SATURN.—Dr. William Meyer of Geneva gives the results of a large series of measures of Saturn and his rings. The measures agree very well with those taken in 1880. He also determined the position of the belt in the southern hemisphere of the planet. Encke's division was observed several times, and its position seemed to be nearer the exterior edge on the left than it was on the right ansa. On one occasion the ball seemed of a grayish-blue tint, while the ring was glittering white in color.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

VOLCANO.—Cor. *Dispatch*, Dec. 8: Since my last letter things have made little or no change, as the scarcity of water prevents the mines from making any headway. The Downs mine is worked on day shift. The Canvin mine is in operation, and getting out good rock. The Modoc mine and Jake Griesback are also getting out good ore. Gillick and Phillips have struck very rich ore about 60 ft deep on the ledge, and it continues to look richer as they sink. They have about 200 tons of the ore in the mill waiting for water to crush it.

NOTES.—*Ledger*, Dec. 8: The mining interest is depressed on account of scarcity of water. The Bunker Hill mill is idle from this cause, and but few men are employed at the mine. At the South Spring hill teams are hauling rock to the mill, a few hundred yards from the mine. The mill cannot be started until rain-fall increases the water in the Amador canal. Everything is in readiness. The first run of a few hundred tons is intended as a test to determine the yield of the rock by mill process. The Plymouth Con. company has, since the consolidation was effected, paid five successive monthly dividends of $50,000 each, aggregating $250,000 up to the 3d of October. The ore-body in the tunnel at the Doyle mine in Hunt's gulch continues to look well. At the Confidence mine, near Butte city, the 5-stamp mill was brought to a stand-still early in the week by the pinching of the ledge. Further prospecting showed the ore-body returning, and it was expected that the mill would be started again in a few days.

SUTTER CREEK.—*Sentinel*, Dec. 5: Sutter creek is reported as looking up. Recent strikes in the Con. Amador, the Iowa and the South Spring hill have had a tendency to give renewed confidence.

C. J. Pillsbury, who has been visiting at the Nevills mine, received intelligence that a mine in El Dorado county, of which he is part owner, has developed a pocket of $10,000 to $20,000.

Inyo.

CHRYSOPOLIS.—*Independent*, Dec. 8: Referring to the Maxim M. & M. Co. that is preparing to erect mining machinery at Maxim station 1½ miles north of Chrysopolis we stated that the rock-breaker was already in position; we now learn that we were misinformed; that the machinery is in transit from New York, and from some cause the shipment has been delayed. This company purchased the Arastra mine, situated one mile east of said station in the foothills. This mine was worked to a limited extent some 17 years since, and in later years has been scratched around the roots of the sagebrush, having been left in a very slovenly condition. The present company has already excavated and wheeled out some 500 tons of waste rock and dirt preparatory to an exploration of the mine in a systematic manner. A shaft is now being sunk on the ledge with the expectation of going down 100 ft before running a level in on the vein. This shaft is down 40 ft on a 3 ft ledge of rich ore.

THE NEW SWANSEA SMELTER.—The work is nearly completed. The finishing touches are now being put on, and the furnace will be blown about December 1st. The new furnace is first-class in every particular. The works are built about 1 mile east of the Swansea works on the toll road from Swansea to Cerro Gordo. The company mines at Cerro Gordo are being worked with very encouraging results. The Swansea company is financially sound, and the new works will start up without one dollar of indebtedness, which has not been the case with all the Inyo county mining enterprises. The starting of the new furnace on Owens lake will infuse new life into this section of Inyo.

Mariposa.

DILTZ MINE.—*Gazette*, Dec. 8: The news from this mine is that the Captain is caving down and railroading out upon the dump large quantities of ore and veins matter from the large open cut lying against the main vein to the south. The whole embankment, which is a face about fifty ft, is a remarkable formation of quartz, from 1 to 12 inches thick, covered with red dirt, ochre and decomposed matter, carrying fine and coarse gold, which is collected in the flume from the winter's wash. In consequence of the absence of a mill, the surface quartz wash, which has been going on for years, has created a vast number of tons of solid quartz suitable for milling purposes, amounting in the aggregate to 25,000 tons, from which has been taken by sluice washing and picking up free gold and nuggets, to the amount of $40,000. It is estimated that every ton of quartz that has been washed has paid $15 per ton. Captain Diltz is contemplating a ten stamp mill.

SWEETWATER MINE.—Groves Bros. reported a favorable clean up made a week or two ago. This is the first result from a two weeks' run, since the completion of the new ten stamp mill.

HO BETTY MINE.—*Herald*, Dec. 7: John Allen, of the firm of Allen & Kiefer, owners of the above named property, reports that work will be recommenced in the mine in three or four days. The shaft is now down 60 ft, and in a well-defined body of ore, which, if Mr. Allen speaks truly, will assay, at the lowest possible figure, $200 per ton. It is their intention to commence drifting from this point and to crush the rock as fast as it is taken out. Owing to lack of money, the facilities for saving the gold, which is "coated" are adequate, and the firm intend working the rock for silver alone. Mr. Allen says the rock will go two dollars gold to one of silver. Mining men will do well to visit this property and judge for themselves.

Mono.

BODIE CON.—*Free Press*, Dec. 4: During the week ending the 1st inst. there were 230 car-loads of ore hoisted from the mine. There were 120 tons of ore sent to the mill and the same amount was crushed. The average pay value of the pulp was $15.80 per ton; that of the tailings was $3.05 per ton. Yesterday's shipment of bars amounted to $6,877.83.

STANDARD CON.—There were extracted and shipped to the mill 1,419 tons of ore; received 2,346 ounces of crude bullion, and shipped to the company $16,324.50. Upraise No. 1 from south drift No. 2, 1,000 ft level, is up 148 ft; progress 8 ft. The vein is 5 ft wide, and looks well.

BODIE TUNNEL.—The south drift 300 ft level has advanced 12 ft. The north drift, 300 ft level, has advanced 9 ft, and the north drift on the 200 ft level has advanced 12 ft during the past week.

BULWER CON.—The north drift, 700 ft level, has been run during the week 19 ft; total length 469 ft.

SYNDICATE.—The mill is running steadily, with good results, upon ore from their own mine. The outlook is favorable for a good yield of bullion continuously.

A NEW DISCOVERY.—*Free Press*, Dec. 9: It is reported that a valuable quartz discovery has been made between Bodie and Sweetwater, the ore being altogether different from that found in Patterson district. The samples exhibited yesterday by one of the discoverers look more like crystallized silica than anything else, but they were full of glistening gold to the extent of $2 000 or $3,000 per ton. From what the *Free Press* reporter could learn, the new find is a continuation of the mineral belt which is now attracting considerable attention in Silver Glance district, which is really a part of Patterson, though their geological characteristics are totally different.

MAY LUNDY.—Homer *Index*, Dec. 8: Considerable activity still prevails in and about the May Lundy mine, and a respectable force is engaged in extracting ore, notwithstanding the recent heavy draft. The mill is running full capacity with over 700 tons of ore in the yard. The snow-storm of Monday caused a temporary suspension of hauling, but the road has been reopened and hauling resumed. Nothing has been heard from the parties negotiating the sale of the mine since they sailed for Europe the second time, but no doubt is entertained but the transfer of the property will take place before the end of the present month.

Nevada.

LITTLE BONANZA CLAIM.—Grass Valley *Union*, Dec. 9: Nicholls and Russell are pushing the drain tunnel on their mining claim near the head of Squirrel creek, known as the Little Bonanza, from the rich specimens of coarse gold and quartz that have been taken out of it. An open cut 300 ft long has been made together with 100 ft of tunnel, leaving 400 ft of tunnel to be completed before reaching the shaft where the pay was so good. Night and day shifts are working and making 12 ft of drift in 24 hours. The tunnel is timbered and boxes laid as the work progresses. The full length of the tunnel will be completed by February, if no hard rock is encountered. The tunnel will drain the ground to the depth of 50 ft, and it is intended to pipe all the ground above. The ground already prospected by the shaft is rich.

IDAHO.—Grass Valley *Union*, Dec. 5: On Monday the Idaho Mining Co. declared a regular monthly dividend of $4 per share, amounting to $12,400. This is an increase of $2 per share over the November dividend. The mine is looking and yielding well.

NOTES.—The sinking of the shaft of the Magenta mine has been commenced at the depth of 365 ft. The rock coming out is of excellent quality. A new level will be opened at 400 ft. Quartz is being taken out on both the 200 and 300 levels.

In sinking the shaft of the Empire mine below the 1400 level the rock is showing very well; as good as at any point above, it is said.

WORKING TAILINGS.—Tri-weekly *Herald*, Dec. 8: Justin Michell has lately worked a quantity of tailings from the Charonnat quartz mill at Canada Hill, and the result obtained has been most satisfactory. Notwithstanding the appliances for saving gold at the above named mill are most complete, Mr. Michell, by his pan process, realized $2.50 per ton from the tailings which are thrown away. The gold obtained is in very fine particles, so light as to be floated away with the sand that is washed from the mill. Mr. Michell proposes to put in a couple or more pans below the Charonnat mill and work the tailings himself, if the company do not see fit to do so themselves.

Placer.

FOREST HILL.—*Argus*, Dec. 6: The Washington Mining Association, whose mine and works are close to Forest Hill, have sunk their shaft to a depth of more than 150 ft, and owing to the presence of water are about to put up machinery that will drain the mine. The Mayflower mine is being worked by Supt. Chappellet with good prospects. The hoisting works over the shaft are substantial and quite a town is being built up around the mine. Breece & Wheeler are said to be striking it richer and richer in their Rough Gold Tunnel. At present only 3 men can work in the drift.

Plumas

THE DIADEM MINE.—Quincy *National*, Dec. 8: From J. A. Edman, who was in town on Wednesday, we learn that everything is progressing satisfactorily at Eagle Gulch. The lower tunnel is in about 320 ft, and taps the vein to the depth of 300 ft. A cross-cut has been run from the tunnel to the foot-wall, fourteen feet, but no cutting has been made the other way. It is supposed that the vein or ledge is some sixty feet between walls at this point. Mr. Edman brought some fine specimens of the rock from this tunnel, which is now being stacked in the dump for milling. It prospects about $40 per ton. The tunnel will have to go some 500 ft to be directly under the rich chimney on the other side of the hill, and the rock showing as it does now, proves that the pay-chimney is of vast extent. A short time since, in the upper level, one man in two days took out over $1,500.

GOOD QUARTZ.—From a gentleman who was in Indian Valley last week, we learn that the work in the Lucky S. mine in Emerald district, is proving it to be better than was expected. The vein has increased in width as depth has been gained, and the horn shows the rock to be very rich. The indications are strong that the property will take a leading place in the quartz mines of the county before another year.

MORE ROOM FOR PROSPECTORS.—Same of 1st: The Halstead mine, of Rich Gulch, has been traveled over daily for 30 years, and hardly a man ever dreamed of the immense body of rich ore directly under his feet. The Four Hills mine, which in a month or two yielded more than $100,000, was crossed by a trail which has been traveled every summer since the country was inhabited by the white man, and at one time a shaft was sunk within a few inches of the edge of the rich deposit. The rich rock in the Edman mine came up almost to the grass roots, and a hundred others might be cited to prove that there are just as good chances to-day in Plumas as in the new El Dorados which lure the miner away thousands of miles.

EDMAN & CO.—We have it on good authority that Edman & Marmlund have struck rich rock in their lower tunnel, and expect from the indications to find still better in a short time. They have a wonderful mine.

Three buckets of gravel in the Loring & Leavitt mine, on Thursday evening, yielded $150, or such is the report. We should call that Thanksgiving gravel.

CAVE CITY.—Cor. of Greenville *Bulletin*, Dec. 5: There is plenty of rich mining ground in the county, but scarcity of wood and water are great drawbacks, though in early days a great deal of gravel and hydraulic mining were done. Quartz mining is yet in its infancy, but what has been done is very encouraging of future results. Cave City once contained 1,000 inhabitants, but in the failure of the gravel mines the population diminished as in other mining towns, till at present the city consists of a hotel, a saloon and a haystack. A few of the curiosities of early times still remain to the place. One of these is the graveyard on the hillside. It contains sixteen graves, fifteen of them filled by men who died with their boots on, between '50 and '56.

BALD MOUNTAIN EXTENSION.—*Tribune*, Dec. 8: The total clean-up of the Bald Mountain Extension Sunday, for the past week's run, was 173 ounces, from 844 car-loads, averaging over $3.81 per car-load. One nugget weighed ten ounces, and others three, five and seven ounces.

RUBY.—The Ruby gravel mine can now be classed among the bullion producers. Thirty-two ounces of gold were cleaned up there week before last, and last week's washing yielded 56 ounces, including a handsome nugget weighing 28 ounces. Two breasts are opened out at present. Three new gangways have been started and as soon as these are opened out and water comes the present working force will be increased; 10 car-loads of gravel taken out of a 3 ft shaft in the main tunnel this week yielded $64. The main tunnel is being driven steadily ahead.

POKER FLAT.—There is considerable excitement at Poker Flat on account of quartz. Lindsay and Sutherland have located the ledge formerly known as the Marchini property on the south side of Canyon creek. Two tons of the rock were sent below, the returns from which were $15 per ton in gold. The ledge is 7 ft wide and has been prospected in 10 or more places with satisfactory results. It is a north and south ledge, and gold can often be seen in the rock.

San Bernardino.

KING MINE.—Cor. Calico *Print*, Dec. 8: Yours of the 3rd just received, and at your request, give you the following facts in relation to the King mine. The mine has been worked by the Oro Grande M. Co. for one year and has reached a depth of 450 ft, showing that the mines do go down. We have transported to the mill by teams a distance of 36 miles, 400 tons of ore, the average assay value of which has been $81.50. Had there been railroad transportation more than twice this tonnage could have been moved. The mill started on the 1st day of March, and has run 9 months, less the ordinary stoppage, from March 1st to June 15th, to present time, with 4 pans and 2 settlers, and in that time has produced $300,000 in bullion. The mine has paid all expenses, paid back to the company all money advanced for developments, and has paid in dividends $75,000. It is estimated that there is ore enough above the 6th level to keep the mill running for at least 2 years.

Sierra.

COLUMBO.—*Tribune*, Dec. 6: The Columbo mine was purchased several months ago by P. Deidesheimer, who represents an Eastern company possessed of abundant means. The claim is located west of the world-renowned Sierra Buttes mine. From an adit level which has cut the vein some 225 ft below the surface a very rich class of ore is exposed, showing free gold in abundance, and giving highly satisfactory results in the hand mortar. The vein is one of the best defined in the Sierra City district. Its average width is 3½ ft, with a general course of east and west. The vein is being energetically opened up. Stopes are being opened out from the upper tunnel and a raise has been put through to the surface for ventilating purposes. Another working adit, that will tap the ledge 450 ft below the surface, has already been driven in 400 ft. A connection has been made between the upper and lower tunnels. At the mill, work has been pushed along with vim in the past few weeks. The structure is under cover and the 20-stamp batteries, engine and boiler placed in position. It is expected to have the mill completed and running by the 20th instant. There can be no doubt that the mine is one of immense value, and that it will shortly be quoted as one of the "big things" of California.

RAINBOW.—W. H. Weldon is negotiating for the purchase of the Rainbow hoisting and pumping works, together with the shaft and right of way in the upper tunnel. Our readers will recollect that the gentleman had located a quartz ledge adjoining the Rainbow claim. His object in making the above purchase is to develop his ledge through the Rainbow workings.

SOUTH FORK.—The South Fork mine, at Forest city, continues to yield handsome returns to its leasers, the Bald Mountain Extension Co. From 427 car-loads of gravel washed last Wednesday, 90½ ounces of gold were cleaned up. The pump at the Pliocene shaft was started up one week ago.

Siskiyou.

ORO FINO.—Cor. Yreka *Union*, Dec. 5: The Eastlick Bros. are taking out their old flume, and will put a new one in its place. They intend putting on a night shift and run the work night and day, in order to be ready for water when it comes. Campbell & Co. have their ditches all cleaned out, and all necessary arrangements made for a large head of water. They have also finished their new flume, and have two large giants in position to make havoc with the western slope of the Oro Fino mountain. If fortune should favor them with a good water season there is no doubt but $40,000 or $50,000 of the hidden treasure will be jingling in $20 pieces before the close of 1884. Messrs. Thos. Mahanly and Orker Alford are taking out some very rich rock from the old Pinkham ledge. This ledge is situated about 1 mile northeast of the ledge owned by the Allen Bros.

Toulumne.

GREAT SIERRA TUNNEL.—Sonora *Democrat*, Dec. 8: The tunnel of the Great Sierra Co., Tioga, is now in over 1,400 ft, and is being pushed ahead as rapidly as possible. Several small seams of galena have been cut so far. The galena in those seams is so impregnated with arsenic that the air in the tunnel is dense with the fumes.

A CUSTOM MILL.—Some San Francisco parties are gathering information with a view to erecting a custom quartz mill here. If the inducements are sufficient the mill will be erected without delay.

NOTES.—Sonora *Democrat*, Dec. 1: The mill at the Lamphier mine started up Thursday. The Sweepstake rotary mill has been completed at the Stockton mine, and will be started up in a few days. The new mill at the Rising Sun mine is about completed, and will be started up as soon as water can be had. It is said to be one of the most complete mills in the county.

NEVADA.

Washoe District.

COMBINATION SHAFT.—*Enterprise*, Dec. 8: The new hydraulic pump is now on the ground, and portions of it (the connections at the 2400 level) have been put in place. As the pump was set up in San Francisco and tested under a greater pressure than it will be required to bear no trouble is anticipated.

CROWN POINT.—About the usual quantity of ore is being extracted and shipped to the mills on the river. Some work is being done in the way of exploring for new deposits of ore at various points. Owing to the hard freezing at nights in the mountains, the water in the Carson river has of late been falling, and the mills are not able to run to their full capacity.

UNION CON.—The south drift on the 3100 level is out over 70 ft. The face is still in vein porphyry and other vein material of no value. The drift coming north on this level is being pushed along at the rate of over 40 feet per week.

IMPERIAL.—The west drift from the 600 station is being pushed as rapidly as possible for the works in the old upper level. It is out over 200 ft.

SIERRA NEVADA.—The upraise from the north main drift on the 2900 level is progressing at the rate of 15 ft per week. The ground works well and continues dry. On the 3100 level are chambering out to the east of the joint Union Con. winze. Good ore is encountered in this chamber.

ALTA.—The water is out nearly down to the 2150 level, but progress is slow, as they are drawing from the drifts. The drifts to be drained measure about 3000 ft.

YELLOW JACKET.—About 120 tons of ore per day are being extracted and sent to the mills, and a good deal of work in the way of exploration is being done at various points.

UTAH.—The replanking of the upraise from the 1350 level has been completed, and a drift is now being run north from the 1750 station.

BEST AND BELCHER.—The joint Gould and Curry winze is being sunk and timbered at the rate of about 15 ft per week. The bottom is in soft, swelling ground, with some increase in the flow of water.

GOULD AND CURRY.—The joint Best and Belcher winze that is being sunk below the 2500 level is now down nearly 100 ft.

BELCHER.—As much ore is being extracted from the old upper levels as the mills on the Carson river are able to reduce. Some work in the way of exploring for new deposits of ore is being done.

CALIFORNIA.—The usual progress is being made in the work of sinking and timbering the joint Con. Virginia winze below the 2700 level.

SCORPION.—The face of the west drift on the 500 level is in vein porphyry that shows frequent streaks of porphyry and seams of clay.

OPHIR.—Are still extracting ore on the 150 level. The work of repairing the drift and upraise on the 1600 level is making good headway.

ANDES.—Some very fine looking quartz is being encountered in the north drift, and in the south drift is found quartz that gives fair assays.

CON. VIRGINIA.—The work of sinking the joint California winze below the 2700 level, is progressing at the rate of about 13 ft per week.

HALE AND NORCROSS.—Good progress is making in the sinking of the winze below the 2700 level, and the ground continues favorable.

OVERMAN.—On the old upper levels they are finding a small amount of low grade ore that will pay for extraction and reduction.

MEXICAN.—Good progress is being made in the work of repairing the drift and upraise on the 1600 level.

UNION SHAFT.—The work of easing timbers and repairing the 2300 station is still continued.

Belmont District.

BELMONT MINE.—*Courier*, Dec. 1: The following is the official report for Dec. 1: The stopes on the 200 ft level are looking well, the ledge is strong, and is yielding good ore. North of Canfield incline we are opening a stope on ore which assays $358 per ton. South tunnel stopes have furnished their usual amount of good ore this week. Winze from No. 1 level Laity ground is down 50 ft; ledge is 10 ft in width, and looks well. Leaching works are going slow, on account of pulp being crushed too fine. Having put on coarser screens, this difficulty will soon be overcome.

Candelaria District.

MOUNT DIABLO.—*Tyne Fissure*, Dec. 8: On the first of the month orders were received from San Francisco to discontinue shipping ore. In consequence the force at the mine has been reduced by the discharge of 25 men, and the extraction of ore stopped for the present. The remaining men have been set at work prospecting. A small streak of good ore found on the intermediate, between the first and second levels, is being drifted upon. A bullion shipment amounting to $8,803.64 was made on the 3d instant; the total shipments on November account were valued at $39,992.44.

COLUMBUS CON.—The shaft has been sunk 15 ft

during the week, making a total depth of 70 ft below the station on the 150 ft level. The south cross-cut from shaft drift No. 2 on the 150 ft level has attained a length of 15 ft. The ground is very hard, hence the slow progress in the extension of the cross-cut. The west drift from the bottom of the Bonanza winze has been extended about 5 ft, from which point a cross-cut was started and has resulted very favorably for the stockholders of the company.

ATTACHED.—Esmeralda *Herald*, Dec. 8: Suits were commenced Wednesday by the Carson & Colorado and Virginia & Truckee railroad companies against the Northern Belle Mining and Milling company. All the personal property of the defendant has been attached both in Belleville and Candelaria. The first company sues for the payment of $10,113 for wood, salt, charcoal and hauling ore, and the latter company for $1,050 for castings.

NOT SO BAD AFTER ALL.—*True Fissure*, Dec. 8: With all the uncertainty of the present appearance of mining and business matters in this vicinity, it is a good sized crumb of comfort that is left. The closing down of the Northern Belle mine, the discharge of 25 men from the Mount Diablo and the the eventual shutting down of the mills at Belleville for want of ore to crush would tend to persuade one that the bottom had dropped out of Columbus district, but it has not. The Mount Diablo is still running, though the force is reduced; the Columbus Con. has not pulled its fires, nor does it mean to do so for some time to come. But, better still, the present idle state of the Holmes and Northern Belle properties will not continue a day longer than is actually necessary. Reliable information has been received from the management of the Holmes company to the effect that operations will be resumed at an early day and on a larger scale than ever before.

Humboldt District.

WILLOW CREEK.—*Sentinel*, Dec. 5: We are indebted to W. H. Mayon, formerly an officer on the police force of Eureka, for the following letter from Willow creek, Humboldt county, Nevada. "Every opportunity confirms me in maintaining the opinion that the outlook for Willow creek cannot be excelled, if it can be equaled, anywhere. Capital is evidently being attracted to this section, as evinced by the presence of prominent experts. Willow creek lies about 50 miles due north of Winnemucca The mines are situated from 3 to 6 miles north of the Idaho road—which here passes through Quinn River valley—on the western slope of what is called the Paradise range of mountains, a range which separates Quinn river from the far-famed Paradise valley. Starting from the valley one finds in the lower foothills a mineral belt, in which lead predominates as the base. In this belt is found the Ohio mine, which has been quietly enriching its owners for years. A mile further up is a belt composed of free-milling silver ores. Another mile further up and we come to what they call here the gold belt, which also carries a large percentage of silver. Some mines on this belt are liable to change hands soon, and when they do there will be a shaking up of all the dry-boned millionaires in the land.

Paradise District.

PARADISE VALLEY MINE.—*Silver State*, Dec. 5: We learn that a lead carrying good ore, and 7 or 8 ft wide, has been cut in the Paradise Valley mine, a short distance to one side of the old drift which was run on the lowest level of the mine. As the Paradise Valley Co. own the Wild Goose as well as the Paradise Valley mine, and both are looking well, the property is considered very valuable.

The Paradise stage brought to Wells, Fargo & Co.'s office here yesterday, 2 bars of bullion valued at $4,542.18, from the Paradise Valley mine. To-day a considerable number of men are employed on property that was non-productive for years, and the mines are producing over $20,000 a month, from the ores worked in a 10-stamp mill. An impetus has been given mining in the Paradise mines, which will doubtless result in the opening up of other claims in the district.

SPRING VALLEY.—We learn from L. F. Dunn, of Vandewater, that there are 75 or 80 Chinamen at work in the Spring Valley placer mines. These mines are situated about 10 miles south of Unionville and it is estimated that they have produced over $1,000,000 worth of gold dust. White men located the mines, and then disposed of them to Chinese.

Pioche District.

DAY.—*Record*, Dec. 1: Work in the mines of this company is being steadily pushed. Ore is shipped to the furnace daily. The mines are working a larger force of men than they have for months. The furnace is being placed in the best of order at Bristol. The indications are that it will make a steady run of several months when it starts, which will be about the first of the year.

SILVER REEF.—The Christy Co., of Silver Reef, intends closing down the mines for the winter. This will make it very dull at the Reef this winter, as the Stormont is the only company now operating there.

Reveille District.

LA SALLE AND GILA.—Eureka *Sentinel*, Dec. 1: From one of the Norris brothers, who came in from Reveille district, Nye county, yesterday, we learn that there are about twenty men in the camp. Mr. Norris brought in two tons of ore from the La Salle mine that assayed $340 to the ton. He says that Gov. Adams had started to erect leaching works to reduce some 2,500 tons of tailings from the Gila mine, which will go from $30 to $60 per ton; but the work was stopped by the freezing of the mortar.

White Pine District.

SILVER CANYON.—Cor. *News*, Dec. 1: At Aurum the "Sadie L." has a very strong ledge, carrying considerable rich ore, and at the Blue Belle a regular eye-opener exceeeded my most sanguine expectations. Here they have recently developed a large body of rich ore, which has the appearance of being extensive enough to keep the mill running for a long time. The Blue Belle is a splendid looking property.

ARIZONA.

LYNX AND GROOM CREEKS.—Prescott *Courier*, Dec. 5: William Vanderbilt returned a short time ago from Lynx and Groom creeks. While on Lynx creek, he was shown through the works of the Howell Co. which are completed. They consist of a 5-stamp mill, with all appliances, including concentrators, a 30 ton smelter, roasters, etc. The entire "plant" was in operation when Mr. Vanderbilt was there. The company have abundance of ore. Crossing the divide, workers were met with in Groom Creek district, where Mr. Clark is putting up a 5-stamp battery. The mill will be supplied with 2 concentrators. The mill which is being erected to work Cherry ores will soon be pounding away. Bullion shipments are made daily from the United Verde Co.'s smelter. Company's mines in splendid condition. Activity prevails in and around the Silver Belt mine, Big Bug district. Ore still goes to Pueblo, for reduction. We heard, yesterday, that Colorado capitalists will soon start milling and mining in Placeritas and Walnut Grove districts.

NOTES.—William Vanderbilt tells us that Jack McDonald has struck it richer than ever in the Blue Dick mine. He has a good-sized ledge of high-grade ore and is taking out plenty of it. The Dosoris Co. continue to ship extra rich ore. In coming from Walnut Grove, Friday last, George T. Hogle passed by the silver mine recently discovered near the Hassayampa. He assures us that he saw silver ore and that the vein is of fair width. Work is progressing favorably in Groom Creek district. Machinery for a 10-stamp mill is being put up under direction of Philip Richardson. Two concentrating machines will make the works complete. Gilford Hathaway tells us that the Howell reduction works are under headway. He recently brought to Prescott several bars of gold and silver bullion. We have nothing new from Jerome, where the United Verde Co. are making and shipping silver and copper bullion. Gavin & Co. are sinking upon the Pine Spring mine, Turkey Creek district. The workmen are in good ore. Black Warrior and Silver Belt are looking well.

THE BONANZA FIRM IN ARIZONA.—Stockton *Independent*, Dec. 6: Tucson is in a blaze of enthusiasm over the purchase of the Ouijoto mines to-day by J. W. Mackay and J. C. Flood, the bonanza firm of San Francisco. The purchase was negotiated by W. S. Lyle, of the same place, who takes an interest with them. The price was $450,000. The mines are located 80 miles southwest of Tucson, and were discovered last May. The purchase was made on the report of J. N. Low, W. S. Patten and Hank Smith, acknowledged to be the best authorities on the coast. They report that nothing was ever discovered on the Pacific coast equal to it outside of the Comstock.

GRAND CENTRAL.—*Epitaph*, Dec. 2: The ledge is one of the best defined we have ever seen, being all the way accompanied by a clay gouge, which is one of the most characteristic features of a true fissure. Here and there a barren spot or horse occurs, followed in some places by the ledge opening into a vast chamber of high-grade ore, from which again the ledge gradually decreases to the usual uniform size. The ventilation is perfect, owing to the fact that the underground workings of this mine are connected with those of the Contention, Flora Morrison and others.

CONTENTION.—From Professor James we learn that the pumps will, without fail, start within ten days, until which time we reserve a more extended comment upon this magnificent property.

FORTUNATE.—While doing assessment work on this little fractional claim, which lies between the Empire, Tranquillity and Goodenough, a body of very high-grade ore was struck. It is being sacked for immediate shipment to the mill. This new strike demonstrates the fact that there are many ore-bodies in that vicinity which as yet have not been discovered.

COLORADO.

GRAND COUNTY.—Cor. Georgetown *Miner*, Dec. 1: John Barbee, manager of the Alice Ormond Mining Co. is pushing the work on the Ruby mine and getting out some very rich ore, principally ruby silver. This company will work all winter. Len. Pollard is also doing good work on his mine, near the Ruby. He gets out 3,000 ounce ore at a depth of 30 ft.

While talking about mines, I wish to say that there is some property in North Park that is again beginning to attract attention in the mining world. The mines are gold placers and are located on Independence mountain. The gold is the heaviest and richest in the west, bringing as high as $20 per ounce in Laramie city and other places. Independence mountain is distant from Laramie city 65 miles.

GRAND VIEW.—The Grand View mine, on Republican mountain, since our last report, shows a wonderful improvement. In the face of the main tunnel level a 4-inch streak of solid sulphuret ore was encountered Wednesday last. The mineral mills over 600 ounces silver per ton and 20 per cent copper. In the bottom of the shaft there is exposed two ft of low-grade ore, besides a streak some two inches in width of blue and green carbonate of copper with black sulphurets. This ore is high-grade also.

BISMARCK.—In sinking a winze in the Bismarck mine from level No. 2 to No. 3, Henry Bates, the lessee took out over 4 tons of rich ore in the first 8 ft. The winze is now about 16 or 18 ft deep, and Mr. Bates has a body of solid mineral 14 inches wide, which will mill over 200 ounces silver per ton.

IDAHO.

ATLANTA.—*World*, Nov. 30: The Buffalo mill has closed down for the winter. There are about 50 men in the camp variously employed. The construction of the new Tahoma mill has been suspended. The Buffalo mine will work but a few men by contract, during the winter. The Last Chance mill and mines have closed operations entirely for the winter. The Leonora mill started up Monday last on ores from the Leonora mine, which has been in operation for some time. Provisions are short at Atlanta, but the trail is still open leading in from Rocky Bar, and a heavy packing business is going on.

BANNER.—The Elmira company, at Banner, put 1,024½ tons of ore from the Banner mine through their 20-stamp mill this summer and fall; result, $107,255. The mill ran 100 days. The ledge was tapped 300 ft deep. At this depth a drift has been run on the ledge 400 ft, and the end of the pay chute has not been reached. Ten stopes have been opened. Above this drift there are about 4,000 tons, 3,000 at the very lowest estimate to be stoped. The vein averages in the lower drift at least a foot of ore, that mills over $100 per ton.

The Elmira company has paid out for labor, supplies and improvements since purchasing the Banner property in 1878, $250,000.

The *News-Miner* says Bayhorse has been one of the liveliest camps in the Territory this summer. The two smelters there have been running nearly all the time. One has shut down on account of the scarcity of coal. There are about 100 men employed in the mines at present—mostly in the Ramshorn.

IMPERIAL.—Wood River *Times*, Nov. 28: Milton E. Pinney yesterday made the final payment on the Imperial claim, up Greenhorn gulch, which he and Jabez Chase purchased a few weeks ago. The price was at the time stated at $5,000 and $3,500, but Mr. Pinney informed a *Times* reporter that the actual price paid was $2,900. Of this amount the lessees got $400, and the owners $2,500. Mr. Pinney says that he would not now sell the "prospect" for $25,000 cash. Since he got control of the property Mr. Pinney has kept about 15 men at development work, and only extracted ore enough to pay running expenses. He has shipped to Ketchum or Salt Lake, during the last 30 days, 50 tons of ore that sold for an average of $105 per ton. He has attained a depth of 150 ft, opened two levels, run two tunnels, and has ore to the greatest depth attained, and a vein 10 ft wide of second-class ore carrying a streak of solid galena which varies from 2 to 20 inches in width.

MULDOON.—John F. Boyle, of the Philadelphia M. & S. Co. got back this morning from Muldoon. He found everything in good order. About a dozen men will be kept at work in the Muldoon mine all winter, and by next spring it is expected that an enormous quantity of ore will be in sight. At the Silver Star and Salamander mines in Smoky district, a dozen men will be employed all winter to run a prospecting tunnel at great depth. At the Ketchum works two furnaces are still running full swing, and will probably not shut down until New Year's day. After that date probably only one furnace will be run.

CŒUR D'ALENE.—Bedrock *Democrat*, Nov. 29: Mr. George Ross, of this county, arrived last Tuesday from the new mines discovered in the Cœur d'Alene mountains. He reports about 900 miners in the diggings from all parts of the coast; Colorado, Utah, Arizona, California and Oregon are represented. The mines are situated 112 miles northeast of Rathdrum, on the North Pacific railroad. From that point it is 12 miles to lake Cœur d'Alene. Thence, 60 miles up the lake by steamer and from the place of landing it is 40 miles over a mountainous road. If preferred, a shorter trip can be made by land from the Rathdrum landing, but owing to the depth of the snow at the present time it is better to go up the lake by boat.

The above gives the first definite idea of the direction of the new mines from Rathdrum which we have seen.

The Palouse *Boomerang* says: Mr. Jesse Bishop, an old miner, has just returned from the new diggings. He has been there for several months and has had an ample opportunity to investigate the many reports, and from actual knowledge can give reliable information concerning the camp. He says there is no doubt but the rich ground extends over a large extent of country, the richest not yet discovered. All the creeks and side gulches give good prospects. Quartz ledges have been struck that are "lousy with gold." But little prospecting for quartz has been done owing to snow, which is 18 inches deep on the hills. The claim owners have held a meeting, and passed a law allowing claimants to be absent until the first of next June. The camp is filling up with roughs from the railroad, who express a determination to make claim jumping a specialty. They say that the 20-acre racket "must go." Mr. Bishop says it is his opinion that every claim in the camp will be jumped before spring.

The Walla Walla *Union* of Dec. 1 says: Dan Armes, of Ainsworth, of the firm of Brush & Armes, has just returned from the Cœur d'Alene mines. He reports that there are now between 700 and 1,000 men in the mines, covering about 20 miles of the "diggings." The gold is coarse and sells at $18 per ounce. Mr. Armes made his first attempt at "panning," and succeeded in abstracting about $7 in the first pan. Three young men worked a few days and as a reward for their labor they cleared about $1,000 in dust.

THE ROUTES TO THE NEW MINES.—*Oregonian*, Dec. 3: The distance from Rathdrum to the mines is nearly 100 miles, while the citizens of Herrons claim that by the trail from their town the distance is only 30 miles. Z. J. Hatch, who has just returned from the Cœur d'Alene country, has formed such a favorable opinion of the mines in that section that he and Captain Sanborn have concluded to build a small stern-wheel steamer to run between Fort Cœur d'Alene and the mission, a distance of twenty miles. They will land passengers within twenty miles of the mines, which can be reached from this point by a trail which will be made a good road in the spring.

MONTANA.

GLOSTER.—Helena *Independent*, Nov. 29: We are informed that the Gloster mine and mill will start up the 10th of next month. Work was suspended August 1st for the purpose of putting pans and settlers in the 60-stamp mill. The company will need 75 good miners. William Schollar, who has had the contract for sinking the main shaft from the 300 to the 400 ft level, has completed it, and work will be commenced at once on the vein at that depth. The west winze has been sunk to a depth of 59 ft below the 300 ft level, and at that depth the vein shows a width of 12 ft, all of it good ore.

TEN THOUSAND FOR FIFTEEN HUNDRED.—Our friend, Saly Raunheim, on Wednesday afternoon purchased of Fred Potting the Gambler claim for $1,500, and yesterday turned it over to the Montana Copper Co. for $10,000. The property is south of the Wake-up-Jim. Mr. Raunheim regards $8,500 as a fair day's wages, and says he would rather make it that way than by working on a newspaper.

ANACONDA.—Butte *Miner*, Dec. 1: A gentleman from Anaconda reports 80 men were discharged from the Anaconda works a few days ago, leaving only a corporal's guard employed about the big smelter. Some of the discharged men went to Cable, and were employed by Supt. Savery.

BONDED.—H. P. Rolfe informs us that the mining property of Holter and Hauser at Maiden—the Montana and Oro Cache mines—was bonded some time ago to an English company for $150,000, the bond to expire the 1st of January, 1884.

JIM WHITLATCH.—Jim Whitlatch, the old Montana rustler, is once more in the field, and from all indications has secured a property which will rival the Whitlatch Union in its palmiest days. Last July he bonded a group of mines for $30,000 in the immediate vicinity of the famous Cable lead, in Deer Lodge county, and which he was then satisfied was extensions of the Cable. The group consisted of the Southern Cross, Sonora, Monitor, Pleides and Monitor extension. Immediately after bonding he put a force of men to taking out ore from the Southern Cross, the most promising of the group. He has now 12,000 tons of ore on the dumps which will go from $8 to $12 per ton in free-milling gold. He is down on the lead 37 ft, and has developed it to a width of 40 ft, but as yet has found no walls. The expense of taking out the ore is only about $1.50 per ton, and the total cost of mining and milling about $4 per ton. Mr. Whitlatch yesterday completed one payment of $15,000, and in the spring will ship out a 20-stamp quartz mill from the East to erect upon his mine. He has already been offered $20,000 for his bargain, but refused. Mr. Whitlatch stated yesterday that before selling the famous Whitlatch Union he had taken from it as shown on the books $3,663,000, and he still has faith in the old mine. He believes that he can strike the lead by a perpendicular shaft of 500 ft.

NOTES.—*Inter-Mountain*, Dec. 3: The Pollock, owned by W. A. Clark and located east of the Poser, is producing 8 tons of ore daily. The last shipment of ore to the Moulton mill returned $101 per ton. The Neptune, also owned by Mr. Clark, is producing 6 tons of ore daily. It is worked in the Moulton mill and pulps an average of $76. In the Fraction, operations are confined to the extension of the 300 ft-level east from the Alice workings. The face of the drift is 130 ft from the west end line of the Alice.

NEW MEXICO.

OLD MAN.—Silver City *Enterprise*, Nov. 28: The sale of the celebrated Old Man mine has been consumated, Mr. Geo. L. Cannon was authorized to make the purchase, as we learn, by Senator Chaffee, of Colorado. The papers transferring the property have been executed. By careful investigation we ascertain that the purchase price is about $200,000. The property is to change hands on the 10th prox.

BALD MOUNTAIN.—The California group of mines in Bald Mountain, the property of Shields, Posey & Hardee, is showing up some splendid prospects. In one shaft the vein has widened to 20 inches from 4, in 10 ft, and the ore has increased in richness, running as high as $400 to the ton.

DUG-OUT CAMP.—A strike of much importance is reported at the Dug-Out camp, in the Eureka district. It is upon a claim owned by J. W. Rolland, one of the old-time prospectors of that section, and consists of a 2½ ft streak of high-grade ore. Enough work has not yet been done upon it to determine the future of the find, but it is reported as being superior to anything yet uncovered in that locality. Sample assays of the ore streak give returns averaging $300 per ton.

LITTLE BUCK.—Las Cruces *Republican*, Dec. 1: From an incline shaft down 60 ft about $20,000 worth of chloride and sulphide ores was taken, most of it from a small pocket about 20 ft below the surface. It is found in a gangue of lime spar, and although the vein is at present pinched it is easily followed. It is a contact between lime and porphyry, and the surface cropping indicate a wide distribution of rich mineral. The Little Buck is 2½ miles north of Organ and the principal work has been done at the south end of the claim. At the other end considerable bunches of the same rich ore have recently been found. Work is about to be resumed.

SILVER GEM.—A shaft has been sunk 126 ft on a 45 degree incline, and nearly a perpendicular shaft is down 76 ft. Silver is found in black sulphurets and carrying as high as 23 per cent galena. The first shipments were less than 2 ton lots and returned about $100 to the ton net. A carload lot netted $89 to the ton and the average of all shipments is $104.

UTAH.

SANTA CLARA RIVER.—Southern Utah *Times*, Dec. 1: Thirty miles west from St. George, near the Santa Clara river, a huge vein of gray carbonate has lately been discovered. At the foot of the mountain where near the surface the vein has been cut, the ore body is 15 ft wide. The gangue is of iron and the ore melts like wax, being free from refractory matter. Near the surface average assays show 20 ounces of silver to the ton and 70 per cent lead. The formation in which the vein is found is limestone. The vein has been traced by its croppings for a long distance.

VALENCIANA AND RAYAS.—In the Valenciana & Rayas mines, says Henry B. Clifford, "there are over 6,000 works aggregating fully 90 miles of drifts, stopes, tunnels and crosscuts, so gouged and cut up that the catacombs of Rome are secondary. These works extend over an area of 4,500 ft in length, by an average of 1,400 ft in depth. The average ore lodes in Rayas are 300 ft, while there is a vein width of nearly 900 ft, carrying a body of ore in places the entire distance. The intervening ground between the excavations are masses of ores, while among the refuse in the dark and gloomy corridors there are millions of cargoes of valuable mineral. Francisco Glennie, the director-in-chief of these mines, informed me that in cleaning out some passages between Mallado and Rayas, he extracted 800,000 cargoes of ore that had been left in the calls by the old Spaniards, and it is his opinion, that there are to-day full $70,000,000, not to mention the amounts in the intervening bodies."

NOTES.—Park City *Record*, Dec. 1: The stations at the 700, in No. 3 shaft, Ontario, are being cut, with the aid of the Burley's. The Creole tunnel is now in a distance of 160 ft. About 50 or 60 ft more will cut the vein. The Crescent working between the Rebellion and Climax show a large vein of ore the entire distance. An important strike was made in the Sampson this week which goes to prove that the chances for a big mine there are most excellent. The vein cut in the east drift of the 200 carries from a foot to 18 inches of ore that assays as high as 300 ounces silver and 70 per cent lead.

For Mining Shareholders' Directory, Stock Reports, etc., see page 388.

The After-Glow.

(CONTINUED FROM PAGE 378.)

of short duration, rendered the atmosphere hazy for the distance of a thousand miles, what could be expected from this greater discharge, in comparison to which Mauna Loa's emission was the effort of a pigmy. The following from Judd's "Volcanoes" will indicate the minuteness of finely-divided volcanic dust, which has on many occasions been transported thousands of miles by the atmospheric currents. "Mr. Whymper relates that, while standing on the summit of Chimborazo, he witnessed an eruption of Cotopaxi, which is distant more than fifty miles from the former mountain. The fine volanic dust fell in great quantities around him, and he estimated that no less than two millions of tons must have been ejected during this slight outburst. Professor Bonney has examined this volcanic dust from Cotopaxi, and calculates that it would take from 4,000 to 25,000 particles to make up a grain in weight." A vast amount of this dust must have escaped during the late eruption, and there is every reason to believe that a portion of it must have been borne northward and eastward across the Pacific—and in other directions also, as previously stated—and that the material now present in our atmosphere is this same volcanic dust, or lighter gaseous vapor or other rare element from the same source. If the after-glow diminishes in brilliancy or becomes invisible at Honolulu and places beyond in the South Sea groups sooner than in California, that fact will be further proof in support of this theory.

GEORGE W. STEWART.

Tulare, Decemher 6th, 1883.

Mining in Arizona

Under the vice-regal rule mining was prosecuted vigorously in Sonora and Arizona, a vast amount of treasure was taken out, and a great deal of work done. The system of mining was crude and imperfect, and the appliances for ore reduction of the most primitive kind. Water and ore was packed out of the mines on the backs of peons, and nothing but ores entirely free from base metals could be worked successfully. But so rich was the grade that under such disadvantages they were made to yield handsomely. The war for Mexican independence put a stop to nearly all mining enterprises in Sonora and Arizona, and in the latter region it never reached that degree of prosperity under Mexican control which it had attained under the government of Spain.

When that portion of the Territory south of the Gila passed into the possession of the United States, there was not a single mine worked within the limits of the Gadsden Purchase, or in all of Arizona. Want of protection from Apache depredations had caused the abandonment of every mining enterprise, and the old shafts and tunnels, and the blackened walls of haciendas and furnaces, were all there was left of once prosperous mining establishments. The first mining done by Americans in the newly acquired Territory was in the Santa Rita mountains. Hon. Chas. D. Poston, who was afterwards elected the first Delegate to Congress, organized the Sonora Mining and Exploring Company and the Arizona Mining Company, some time in 1855. These companies secured possession of many of the old mines which had been opened in early times by the Mission Fathers, and recommenced work upon them, aided by all the improved machinery and appliances then in vogue. Many difficulties had to be overcome, and many dangers to be met. The country was overrun by the murderous Apaches: machinery, tools and supplies of every kind had to be freighted overland for hundreds of miles, skilled labor was scarce, and the country was virtually isolated from civilization.

But against all these obstacles operations were pushed vigorously forward. Roads were opened, huildings erected, hoisting works put in place, mills and furnaces were constructed, and the sights and sounds of a prosperous mining industry were again seen and heard in southern Arizona. Tubac, the headquarters of the company's operations, became the most prosperous town in the Territory, and could boast a mixed population of between 400 and 500, with handsome residences, store-rooms, gardens, orchards, and many of the luxuries of civilized life. At Santa Rita, Sopori and Arivaca the reduction works were constantly at work, and a great deal of bullion was taken out. The ores were exceedingly rich and easily reduced, and, notwithstanding the constant raids of the Apaches, the work of development went steadily forward.

The breaking ont of the Civil War brought to an abrupt ending this effort to develop the mining industry of Arizona, and retarded for years the Territory's advancement. The garrisons stationed in the country were withdrawn, and the population of the country left to the mercy of the Apaches. At this time camps were established at the Patagonia, the Santa Ritas, Cerro Colorado, Sopori, and in the Cabibi district. The withdrawal of the troops was the signal for the savages to make their incursions more openly and vigorously. The marauding Mexicans from Sonora, believing that the government of the United States was broken up, crossed the border in large bands and carried off what the Apaches did not destroy. Exposed to constant attacks, surrounded by savage foes, and harassed by semi-savage outlaws, the mining camps and haciendas were abandoned. Tubac was surrounded by a horde of bloodthirsty wretches, and had not a party from Tucson come to its relief, every person within its walls would have been massacred. The Apache and the Sonorian outlaw burned, robbed and destroyed. Tubac was reduced to a mass of blackened walls, and in a few short months heaps of desolate ruins were all that was left of the prosperous mining camps of southern Arizona. Those who were fortunate to escape with their lives fled from a country which seemed accursed of heaven and a very hell upon earth.

Two years of death and desolation passed over Arizona before the mining industry was once more revived. This time it was in northern Arizona, and gold was the glittering prize that allured thousands to the banks of the Colorado. In the year 1862, placer gold in paying quantities was discovered by Pauline Weaver, in the neighborhood of La Paz, and within a year over 2,000 men were digging and delving after the yellow treasure in the mountains and dry gulches east of the Colorado. A year later a party headed by the same indomitable old pioneer discovered the diggings which bear his name in Yavapai county, and a short time after the whole coast was electrified by the wonderful discovery of Antelope Peak. This find attracted thousands of adventurers to northern Arizona, and mining received such an impetus as had never been known in the previous history of the Territory. Ledges of gold, silver and copper were discovered and located, rich placer deposits were worked successfully, quartz mills were erected, and a veritable boom appeared to have struck Yavapai and Mojave counties. The mines worked were all gold-bearing, the quartz being exceedingly rich and easily reduced.

But in the meantime the Apache was not idle. He saw his chosen domain invaded by the pale faces, and he saw the hated race receiving fresh reinforcements day after day. He saw the game ruthlessly slaughtered and his favorite mescal grounds staked off and claimed by the prospector, and he resisted the advance of *los Americanos*. By the lonely trail and the public road, behind bush, and rock, and tree, the red assassin lay in wait for his victim, and many an unsuspecting pioneer was sacrificed to his hate. Provisions and supplies of all kinds were only to be had at extravagant prices, almost everything being brought across the Colorado desert at a cost of from twenty-five to fifty cents a pound. Under such unfavorable conditions it is no wonder that mining made slow progress in Arizona. But, nevertheless, it did advance. Capital was invested, many mines were opened, and a number of mills and furnaces erected, and considerable gold found its way out of the country.

The placing of the hostile Apaches on reservations, in 1874, marks one of the brightest periods in Arizona's history. Fresh life and hope were infused into the mining industry all over the Territory; prospectors struck into the regions lately infested by the savages, and Globe and Silver King were the rewards of their toil and industry. The fame of these discoveries spread over the land; thousands of restless adventurers turned their faces southward, and millions of dollars sought investment in Arizona mines. The discovery of Tombstone, a few years later, created a grand excitement, not only on the Pacific coast, but throughout the East, and the rush to the wonderful Arizona camp has only been equalled by that to Leadville. The high grade of the ores, the vast extent of the deposits, and the small cost of reduction, caused a heavy investment of capital in the bonanza camp. The steadily increasing yield of bullion has been the marvel of the mining world; has demonstrated beyond cavil or doubt the richness of Arizona mines, and shown that her right to wear the title of queen of our mineral realm is well founded and fairly won.

The completion of the Southern Transcontinental route in 1879, and of the Atlantic and Pacific the present year, have removed the bars of isolation, and opened the Territory to immigration and capital. All portions of Arizona have felt the quickening and progressive impulses imparted by the iron rail. The country has been drawn into close communication with the great commercial arteries of the Union, and no longer is beyond the pale of modern progress. Its vast resources are becoming more thoroughly understood and appreciated, and the mining interests of the Territory have entered on a career of prosperity never before known in its annals. Capital is seeking investment, mills and furnaces are being erected, new discoveries are being made, and new camps are springing up, prospectors are swarming through mountain and plain, a steady stream of bullion is finding its way out of the country, and Arizona is pushing its way to the front place as the leading mineral region of North America. The brilliant future which many of her ardent admirers years ago prophesied seems at last about to be realized. The legends, tales and traditions of the past, about her wonderful wealth, are proved to be well founded, and some of the late discoveries would show that the half has not been told about the metallic treasures of this wonderful land.—*Hamilton's Resources of Arizona.*

THE RAILWAY SYSTEM OF INDIA includes some 8,811 miles. The gauge is three feet and six inches. All lines are built primarily for military and not commercial purposes.

GOOD rains are reported in the southern part of the State.

Recollections of California Mining Life.*

Men and Events in the Pioneer Days—No. 5.

[Prepared for the MINING AND SCIENTIFIC PRESS, by HENRY DEGROOT.]

Why the Early Pioneers Failed to Make Money.

Peter Wimmer, who was with Marshall in the mill-race when he picked up the first piece of gold, though a man of good habits, industrious, temperate and possessed of fair business capacities, never succeeded in acquiring much property, the extent of his worldly wealth consisting of a small piece of land in San Luis Obispo County, on which he and his pioneer wife are, or at least were, living not long ago. Bennett, who brought the first samples of gold to San Francisco, though far from being rich, is in comfortable circumstances, owning and living on a piece of good land in the vicinity of Santa Cruz. He left the mines in the summer of 1849, and never returned to them. Of the considerable number of white men who were at Sutter's mill when gold was discovered, none ever became rich, nor did any of them ever acquire more than a very moderate competence. Several are known to have died, if not in indigence, at least quite poor. Of the residents of the country at that time only a few afterwards became millionaires, and these were made such through the increased value of their landed possessions, or by their engaging in other than mining pursuits. The causes that brought men to California at that early day were such as little qualified them for rapidly accumulating property. The most of them came here in search of health or adventure, or in the hope of being able to live in an independent and easy-going way. Some were hunters and trappers, who, in pursuit of their vocation, having drifted into the country, remained here. Some were border men, who had sought on this far-off coast a refuge from a too rapidly advancing civilization. A few were run-away sailors or mariners, who, attracted by the beauty of the country, the excellence of the climate and the hospitality of the inhabitants, had been enticed into a long sojourn on these pleasant shores. Whatever the causes that brought or kept them here, hardly any of these pioneers had in view the acquisition of wealth; wherefore, none of them can be properly called Argonauts, using that term in its primary sense. They were for the most part a hardy, brave and generous set of men, whose habits being simple and their wants few, neither craved nor had any need for much money. The most of them left the mines early and retiring to their homes in the lower country, never troubled themselves much with gold digging thereafter.

Concerning a few of the more noted of this class something will be written a little further on; though, truth to say, it hardly needs that their names be even so much as mentioned in these fugutive papers, seeing so much that is noble and good has been recorded of them in the great work of Hubert Howe Bancroft on the Pacific States and Territories. Embalmed in the pages of the illustrious historian, their memoirs will be handed over to an honorable and an enduring fame. The Natural Wealth of California, by Titus Fey Cronise, contains also much that is interesting in regard to the lives and characters of these men, who, journeying far by land or water, came early to make for themselves homes in this border-land of the Great Pacific Sea.

The New Era.

Arriving at San Francisco in the month of February, 1849, the writer found the place crowded with miners, who, leaving the diggings at the commencement of the rainy season, had come to the city to pass the winter. A more motley crowd, or one composed of such divers nationalities was, perhaps, never before collected in one place. Almost every civilized people on the face of the earth was already represented here. The Mongolian only, of all the races now in the country, had not yet put in an appearance, the worst coming last. San Francisco, although a very Bable of languages, and the scene of indescribable activity, had up till this time remained peaceful and orderly, crimes and even misdemeanors of a grave kind having been of rare occurrence. While the merchants were busy, and the public places were thronged with frequenters and patrons, the miners, unconscious of impending events, were taking things easy. Though current wages were an ounce per day, not until they got dead broke did these old timers seem disposed to seek or accept employment. By the time spring came around the most of them had got rid of their earnings, a good share of which had passed over the gambling tables. Early in March and before more than a few of them had begun to think of returning to the mines, the advance of the new immigration had begun to arrive—an excited, eager, rushing crowd—who going for everything within reach, soon relegated to the background their predecessors in the field. To such an extent, in fact, has the year commemorated by the discovery of gold come to be overshadowed by the stirring event that followed in its wake, that the year 1849 is generally accepted as marking the advent of the new epoch in our history. Being so little in accord with the spirit of the new comers, and not over anxious to enrich themselves by gold digging, many of the forty-eighters, as already stated, left the mountains before the summer of '49 was over and returning to their homes, engaged in pursuits more congenial to their tastes and previous habits of life.

With the year 1848 all that was staid and primitive in or about the mines of California vanished. With it ended the old civilization and the old scenes, new men with new ideas and different methods of doing business having come to take the place and accelerate the work of the first stock of pioneers.

*This series of articles will be issued in a new form, with other matter, during January, 1884. Rights reserved.

Technical Training

It is not unfrequently noticed that men who pride themselves on being "practical," are the most inveterate theorists; and equally droll is the quiet confidence that the schoolman often has in his ability to work in the shop or mill if he wanted to. It needs the personal contact of these two classes of men to develop mutual confidence and respect, with the elimination of ignorance. Happy is the man who combines in himself both the knowledge to think and work.

We are very fortunate in this country in having a society in which the schoolman and craftsman, the engineer and the iron worker, the chemist and the furnace man, meet on common ground, without fear or jealousy, to learn from one another. No society in our day has made more real progress and done more good work than the American Institute of Mining Engineers. Its *Transactions* contain the record, side by side, of the best practice and the highest scholarship. This is the *fellowship* of theory and practice.

Technical schools are not indigenous in this country, they have been transplanted from Europe, and were originally formed on German models. The rapid development of our mines of the precious metals in the west, found us without the necessary technical skill to work them advantageously, and we were particularly deficient, two or three generations ago, in the knowledge necessary to work these ores profitably. German metallurgists came in large numbers to this country, and our young men were sent to German mining schools to fit themselves to take charge of mines and smelting works.

Many of us can well recall the young American return to his native shore after a sojourn of two or three years abroad. He brought back with him an elaborate case of blow-pipe instruments, a collection of minerals and hammers, a well-assorted library, particularly rich in the German classics, an intimate knowledge of foreign social customs, a vocabulary liberally enriched in foreign technical terms, and a look and an air that seemed to say, "I am ready to show you how it is done." They had no difficulty in securing positions to put their knowledge to practical use, and while a few of them were successful, it must be confessed that many of these young men made lamentable failures at the start, causing loss to mine and mill owners, and bringing discredit on systematic instruction. We must also admit that the early graduates of our American mining schools were also often unsuccessful at first. There was evidently something wrong either in the works or in the schools; and as a consequence, the school teaching of practical science sustained a serious check. The schools thought the works were jealous and put obstacles in the young men's way, and the shops thought the teaching of the schools impracticable, and unfitted the men for work. The trouble was simply that the young men had studied one side of the subject and attempted to practice the other. It was the case of an imperfect science attempted to instruct a well developed art.

Very often the trouble arose from the attempt to introduce foreign metallurgical methods into American practice, ignoring the fact that mining and smelting are primarily economic problems, and that the successful treatment of ores in one locality may be a failure in another. It is not in the least soothing to the capitalist, who discovers that his metallurgist uses more money to get the gold from the ore than it is worth, to be told that the process was scientifically correct and had been successfully used elsewhere.

Patience on one side and perseverance on the other brought about, at length, a better understanding, and the practical man recognized that the graduates of the technical schools were the best raw material for making promptly managers and superintendents. The school learning gave him an advantage at every stage of his work over the ordinary workman. This recognition reacted favorably on the schools, and the young men no longer thought their first duty was to instruct, but to apply their school knowledge. There is now no longer any distrust of the schools on the part of the works, in fact we may say that the schools have conquered the works, for the practical managers are now very generally the graduates of technical schools, and are very glad to get young men with technical training. They know just how to treat them and what kind of work to put them at. More than this: these managers begin to discriminate among the schools, finding some young men better trained than others, and there has thus arisen a beneficial rivalry among the schools to give young men the preparation best calculated to secure them places for work. Competition in schools is as healthy as competition in trade, and it is worth while to discuss the question what is the best course to pursue in teaching science as applied to the arts.—*From an address by Thos. M. Drown, published in Jour. Franklin Inst.*

THE ENGINEER.

Trial of the Hydromotor.

A most interesting trial of an invention, which, in the opinion of the naval and technical authorities who witnessed it, promises to effect an important change in the propulsion of vessels of all classes, was conducted on October 11th, on the Elbe, near Dresden. The inventor, Dr. Emil Fleischer, has applied the principle of hydraulic reaction to the propulsion of ships in a manner which, according to the testimony of officers of the German Imperial Navy, like Admirals von Henck and Werner, is as simple as it is effective. It does completely away with all risks from accident to rudder or machinery, for there need be no rudder, and there is scarcely any machinery: solves the problem of avoiding loss of power through transmission, for there is hardly any transmission; and, finally reduces the perils of the sea to a minimum, so far as injuries to the machinery are concerned. For as Admiral Werner explained, the same immense force that propels the vessel can, at a moment's notice, be used to pump her so effectively that she would remain afloat with a considerable leak in her bottom; while in case of fire there would be no difficulty in quenching it.

The vessel, named the Hydromotor, is sixty meters long by seven meters broad, draws .60 meters, and is throughout constructed of iron. The navigation of the Elbe near Dresden presents many obstacles in the shallows and rapids which occur at frequent intervals. Noiselessly and without any oscillation did the large vessel —large as compared with the steam craft plying on that part of the river—after the simple turning of a lever by the Captain on the bridge, commence its trial trip, stemming the current and keeping an even course under the picturesque right bank of the river. The only noise audible was that of the rushing of the water from the tubes, fixed a little above the level of the river, and nearly amidship, on both sides of the vessel. Another turn of the lever and the action is reversed. The vessel comes to a dead stop in less than her own length. By the alternate use of the levers she may be turned round on an almost stationary pivot. The Captain handles the levers on his bridge independent of all communication with the engine-room. The gentleman present watched the trial with the utmost interest. Arrangements are now being made to apply the invention on a very large scale. The opinion of Admiral von Henck regarding the hydromotor is as follows:

"The principle being correct, the invention has almost certainly a future before it if it be subjected to certain alterations. Beyond doubt the hydromotor is eminently useful for river ships, especially in shallow rivers, because it draws very little water, and in canals, because it raises no waves and consequently does not injure the banks. It is also of decided importance as an auxiliary steam engine in sailing ships, when there is no wind — as often happens, for instance, in the Mediterranean and in the tropics. Another advantage it has for sailing ships is that it does not require extra hands. It will undeniably be of value in war ships also, for, auxiliary to the screw, it will considerably increase their power of turning, and therefore, their power for attack and defense. How far the hydromotor will be able to modify or even supersede the present ship engines it is as yet impossible to say. Certainly it will do so to a considerable extent."—*Berlin Corr. London Times.*

A NOVEL STEERING APPARATUS is to placed in the United States tug Nina. The apparatus is the invention of J. J. Kunstadter, a Hungarian, and it has been used with success in Europe. The shaft of the propeller is carried through the rudder-post, and there by means of a universal joint is connected with a shaft running through the rudder, and having at its end a supplementary screw. The universal joint allows the rudder to move freely, and yet establishes a perfect connection between the main and the supplementary screws. It will be readily seen that when the helm is put to port or to starboard the driving power of the supplementary screw is brought into play to turn the vessel. The vessel is thus turned quickly in a small space. In cases where there is danger of collision and the engines are reversed, the vessel can be driven backward and completely out of her course in an exceedingly short space of time, as experiments have shown.

THE CAPE COD CANAL PROJECT seems at last to be in a fair way of being carried out. A company has been organized which evidently means business. By order of the selectmen of the town of Sandwich—through which the canal will pass, a meeting of citizens has already been held to agree upon a price at which the land required will be sold. The improvement is one that is much needed.

THE FIRST LINE OF TELEGRAPH was erected less than forty years ago, and at the present time there are more than 1,000,000 miles in operation. The United States comes first, with 250,000 miles, with the immediate probability of adding another 100,000 miles; Germany comes next with 150,000 miles, and the great Chinese Empire last, with 1,200 miles.

USEFUL INFORMATION.

Animal and Vegetable Stings.

It is well known that the effect of the common or vulgar stinging nettle on the skin agrees very closely with the sensation produced by the sting of a bee or wasp. But the great similarity is not limited to the feeling it causes, but, what may not be so well known, the cause of the irritation produced on the skin is essentially the same. It may be considered as definitely settled that formic acid is present in the poison sac of the bee sting, in the so-called bee poison. The same corrosive acid also occurs in the sting of the nettle. Some species of caterpillars have formic acid in some of their hairs, which they seem to be able to shake off at will, and when a person touches such a caterpillar the poison penetrates the skin wherever it is moist, and causes burning, itching, and inflammation. Those poisonous members preserve their irritating powers even after the death of the worm. This accounts for reliable statements that visitors to collections of caterpillars have suffered from exantbematous eruptions on the neck. "Many hairy caterpillars cause itching and burning of the skin when touched, and sometimes it gives rise to swellings and redness. This depends on the fine hairs, which produce the same effect when they float around in the air. Many ladies who visited the caterpillar room of the naturalist Reaumur had a breaking out on the neck."

As regards the irritative action of stinging nettles and other similar vegetables, it depends, as already stated, on its formic acid. The point of the nettles is brittle as glass, and by the lightest touch penetrates the skin and breaks off, pouring out its acid and causing the burning sensation.

In this little notice frequent mention has been made of formic acid. In conclusion it may be stated that it gets its name from the ant (*formica*), because it was *first* found in them. If it had been found first in the bee or the nettle it would have received another name. If an ant runs over a piece of blue litmus paper, he will leave a red streak. Put a stick in an ant hill, and they will squirt strong acid on it.

It may also he added that the nettle has heretofore been recognized only as a pest to he avoided or destroyed; but now comes the report that in Germany this weed is being extensively cultivated, and an immense number of textile articles are manufactured from its fiber. A Dresden manufacturer has obtained from it the finest thread known to the trade, of which sixty miles in length weighs only two and a half pounds.

A NEW FUEL.—The *Mexican Financier* gives an account of a new fuel invented by a member of a commercial house in the City of Mexico, and for which a patent was obtained from the Mexican Congress in May last. The article is called "turbato," and consists principally of bog peat, of which there are immense quantities in Mexico, mixed with a proper proportion of bitumen. The fuel is made in five different classes, for locomotives, stationary engines, smelting purposes, smith's fires and household purposes. It burns freely, without much smoke, giving a higher dynamic equivalent of heat than the same amount of wood and very nearly as great as the best English coal. It can be manufactured and sold in Mexico at a price considerably below coal or wood, and, looking at the daily increasing demand for fuel, the augmentation in the price of wood, and its growing scarcity, the *Financier* says that it is safe to predict a large and successful market for "turbato." As all the ingredients necessary for its manufacture are found in inexhaustible quantities in Mexico, it will create a new and important industry in the republic.

A NICKEL-PLATED ENGINE.—A model 60 horse-power nickel-plated engine has been recently constructed at the machine shops of Messrs. Duvall & Co., Zanesville, Ohio, to he used in running their works, which are the oldest in the city. The engine is said to he a marvel of beauty, and the machine room in which it has recently been set to running is fitted up with massive black walnut furniture, large mirrors, and other adornments, including gold-fish and flowers, presenting more the appearance of an elegantly furnished parlor than anything else. This engine room has plate-glass windows on three sides the entire hight of the compartment, commanding an extensive street view that exposes it to the observation of every one coming into or leaving the city of Zanesville by rail. To crown the whole, the engine is in charge of Miss Sarah Bogue, niece of the senior proprietor of the works, a beautiful, accomplished and talented young lady, sufficiently acquainted with the science of mechanism to discharge the duties of an engineer.

REMOVING RUSTY BOLTS.—To remove bolts that have rusted in without breaking them, the most effectual remedy known is the liberal application of petroleum. Care must he taken that the petroleum shall reach the rusted parts, and some time must he allowed to give it a chance to penetrate beneath and soften the layer of rust before the attempt to remove the bolt is made. Bolts and studs on which the nuts are fixed with rust are broken off through impatience. In most cases a small funnel built round a stud or bolt end on the nut with a little clay, and partly filled with any of the searching petroleum oils, and left for a few hours, will enable the bolt or nut to be moved.

SAND-SHARPENED FILES.—The value of sand-blast in sharpening files is not limited to the restoration of those that have been worn out, but it is equally evident in the first cutting. Experiments have been tried with bastard files which were finished by the sand-blast upon one side while the other side was simply cut in the ordinary manner; other files of the same size were also tried, which had been worn out and resharpened by the sand-blast. With these files three pieces of gun metal, of equal size and quality, were worked by making fifty thrusts at a time upon each piece, and continuing until one of the files became useless. A similar experiment was tried with cast iron, wrought iron and steel, showing that the newly finished files were the first to give out, and those which were finished with the sand blast were the most durable of all.—*Dingler's Journal.*

LIME WASH FOR WOOD OR STONE.—For a useful lime wash for wood and stone this is the proposed preparation: Twenty liters of quicklime are slaked in a suitable vessel. One gramme of sulphate of zinc and .5 gramme of common salt are added. The latter causes the lime to dry without making any cracks. A very beautiful fawn color is produced by adding to the mixture .5 gramme of yellow ocher, or if a stone color is desired or preferred, two grammes of amber and one of lamp-black may be substituted. A common brush may be used in applying the wash.

FUEL water gas, it is said, has won complete success at Lynn, Massachusetts. The Citizens' Steam and Gas Company, as we noticed some time since, discarded steam heating, and contracted for the Lowe fuel gas process. The latter has been introduced, and gives, in actual practice, most complete satisfaction to the company and consumers. Lynn has one more laurel leaf added to its growing wreath.

PURIFYING WATER.—Water containing vegetable matter may be purified hy dropping in a gallon of the water 2 or 3 drops of muriated tincture of iron. In the course of an hour or two the iron will carry all the organic matter to the bottom of the vessel, leaving the water pure and wholesome. This will not purify water that contains noxious gases, such as come from drains and cesspools.

A NEEDLE'S POINT.—We call a sewing needle a sharp-pointed instrument. At a recent microscopic exhibition, the point of a fine needle was shown upon a screen, magnified to a bluntness of five inches across. Man can not make a sharp point.

AN old but good idea, and one not generally known, is to line the jaw of the vise with sheet lead when clamping saws for filing. If not so lined the saw will vibrate and probably strip the file.

GOOD HEALTH.

Potato Digger's Disease.

Dr. W. Zenker, of Stettin, has recently given a description (*Berliner Med. Wochenschrift*) of a "new disease" which affects farm laborers, particularly those engaged in digging and gathering potatoes. Dr. Zenker calls it a "new disease" in the sense that it has not before been described. He believes, however, that it must have existed for a long time among the peasantry of Germany and all agricultural regions. The disease is thought to he a neurosis of the locomotor apparatus of the feet and legs, the thighs and trunk not being affected. It is caused by the peculiar strained position into which the legs and feet are thrown while digging and gathering potatoes. The laborer, says Zenker, stoops down and supports himself upon the knees and feet. He moves about in this position with the knees strongly bent and feet strongly extended, and he keeps at this for hour after hour for many successive days. The position is not a natural or easy one, and any beginner who attempts it will soon feel a weariness in the limbs.

The result of this kind of labor is that in some cases one or both feet and legs become paretic, the paresis affecting both motion and sensation. The patient finds that one extremity feels heavy, cold, numb, and sometimes painful, and the foot drags in walking. The physician on examining it finds that the movements of flexion and extension are slow and weak. Lateral motion is limited. The affected leg feels colder to the touch than the healthy one. Tests show a loss of pathic and tactile sensation almost complete. In some places electric currents are but slightly felt, while both faradic and galvanic reaction, though present, are feebler than normal. The leg does not atrophy.

A case of this kind may rapidly improve, or it may continue almost *in statu quo* for several years; the patient still walks about, though with a limping gait. The treatment, so far, consisted in foot baths, massage and electricity. It has not always proved successful.

Dr. Zenker reports in detail only five cases, but he believes that the disease can not be a very rare one in the autumn months, and begs that other physicians practicing in the country will report the results of their observations.

We are unable to say whether any such affection exists in this country. It has not been described as yet in any American text book. It would be a matter of interest to know whether any of our readers have come across the disease. —*Medical Record.*

CURING CHOLERA.—Our consul at Port Lewis, Mauritius, communicates to the Secretary of State of the United States the fact that Mr. T. Edward Eyers, although not a physician, has been very successful in the treatment of cholera. It is reported that he lost but one patient out of 150 who were attacked by the disease. Here is the remedy he prescribed: "On the first appearance of an attack there must he administered an emetic of thirty grains of ipecacuanha and two grains of tartar emetic. After the emetic has acted, copious draughts of warm water must be taken upon the stomach. In case either vomiting or purging continues, the usual doses of dilnted sulphuric acid are sure to stop it." Mr. Eyers may be right, and if he is, he has made a discovery that will, so to speak, put a curb in the mouth of that terrible contagion which "stalks in darkness through the land." Only one death out of 150 attacked with cholera is certainly something astounding in the history of the disease.

DIGESTION OF FRUITS.—Fruits are prepared, by the process of ripening, for ready and easy digestion hy the stomach and other digestive organs. Nothing digests more quickly than a ripe apple. This is not true, however, of grains and vegetables. The nutritive elements of these classes of food require the action of heat to bring them into the same condition which is brought about in fruits by the process of ripening. Hence we would not advise any one to attempt to live upon raw grains and vegetables. While it might be possible to maintain life, it would by no means he for the best interests of the digestive organs to adopt such a dietary. We know of no objection whatever to the cooking of food. The heat, in various ways, simply performs a sort of preliminary digestive process, rendering the elements more easily soluble in the digestive juices than they could otherwise be.

TEA AND GIN.—With reference to a paper read by Dr. Benjamin Richardson before the Sanitary Congress, at Glasgow, the London *Standard* points out that "electrical condition, cold and heat, purity and impurity of the atmosphere, foods, drinks, and, of course, narcotics have also a remarkable influence on happiness or unhappiness, by the temporary stimulus which they afford, and the more or less lasting depression they produce. Tea is a "cheerer" Dr. Richardson admits; but, like tobacco and wine, it is also a depresser when the reaction sets in. Indeed, to many people it will be a sort of revelation to learn that it is the cause of almost as much misery as gin, many women, especially in the weaving districts, never knowing a day of felicity, owing to this one destroying cause.

TO CURE STAMMERING.—Dr. Dio Lewis, in his magazine gives a rule for the cure of stammering which is certainly simple enough, and which the doctor says has cured three-fourths of all the cases that he has treated. The stammerer is made to mark the time in his speech, just as it is ordinarily done in singing. At first he is to beat on every syllable. He should begin by reading one of the Psalms, striking the finger on the knee at every word. "Time can he marked," says the doctor, "by striking the finger on the knee, by hitting the thumb against the forefinger, or by moving the large toe in the boot." The writer believes the worst case of stuttering can he cured if the victim will read an hour every day, with thorough practice of this remedy, and observing the same in his conversation.

PEROSMIC ACID is a new remedy employed by Prof. Winiwarter in cancerous and scrofulous swellings. It is used by injecting daily three drops of a one per cent solution of the acid, which treatment causes the tumor to soften and decrease in size; the dead tissue is thrown off and disappears in about a month. No curative effects upon cancer itself have been observed from the remedy.—*Rundschau, Leilm.*

SALICYLIC ACID TO AVOID VARIOLA.—The editor of the *Southern Clinic* certifies along with Dr. Claridge and Dr. De Cailhol, to the abortive power of salicylic acid in variola, given in the ordinary doses. Dr. Bryce thus concludes: "I believe salicylic acid used early and freely will place smallpox in the category with measles, chicken-pox, and other trifling complaints. —*Louisv. Med. News.*

HEALTH OF PRISONERS.—The official returns show that the healthiest class of people in Great Britain are the inmates of prisons, where simple diet, regular hours and exercise are compulsory. But the cases of insanity among the convicts are out of proportion to the number of ailments. To commit a crime a man must be more or less mad.

MINING AND SCIENTIFIC PRESS

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SAN FRANCISCO:

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Passing Events.

The magnificent weather continues with us, the mornings being frosty and clear, with warm, sunny days, and no present indications of rain. The peculiar reddish glow in the sky in the early morning and late evening seems to prevail over a large extent of the country, and many theories are advanced to account for it. We refer to the subject quite fully elsewhere.

All the trails and roads in the Cœur d'Alene country are covered with snow, so that there is no use in any miners thinking of doing anything in that region for many months. It is evident, however, that there will be a rush there in the spring, and many are already making plans to go to the new diggings.

Mining matters are rather quiet generally just now. The highly important debris suit is still pending, though the Judge may give his decision any day. In fact, it is hourly expected.

MECHANICS' FAIR.—The fair recently held in this city under the auspices of the Mechanics' Institute, was more successful financially than was expected. At a meeting of the Institute on Saturday it was reported that the receipts this year from all sources had amounted to $47,446.69, and the expenses $21,827.01, leaving a profit of $25,619.68, of which $17,500 had been transferred to the institution.

THE Red Cloud Consolidated mine, Noonday mine and North Noonday mine at Bodie were recently sold by the Sheriff for $250, subject to demands amounting to $524,676. The sale includes all the properties of those incorporations, real and personal.

Field Work in Surveying Claims.

It has been customary to require from applicants for mineral surveys a deposit sufficient to pay all expenses incident to a survey of the tract applied for, this deposit to equal the estimated cost of a survey, plat and publication of the notice, and be made before commencement of the survey.

A short time ago a miner made application for patent, but selected his own Deputy Mineral Land Surveyor and paid him. When he came to deal with the Surveyor-General a deposit was required for a mineral surveyor which he refused to make, having already employed a duly certified mineral surveyor. The Surveyor General registered his application and the miner then appealed to the Commissioner of the General Land Office, who decided that the Surveyor-General was right, and rejected the application because unaccompanied by a deposit of money with the Surveyor-General for survey by an U. S. Deputy Surveyor. The miner was still unconvinced, and again appealed his case to the Secretary of the Interior. That official, after studying up the matter, has now decided that the miner was right, and the Surveyor-General and Commissioner of the General Land Office both wrong.

Under the old law of 1866 the applicant had to pay all the expenses incident to the survey of the tract, and the regulations required from him a deposit equal to estimated cost of survey, plat and publication of notice, before the commencement of survey.

The ninth section of the act of May 10, 1872, repealed the section of the old act which required this deposit, but Sec. 12 of the act of 1872, continuing the requirement that the applicant should pay the expenses of survey and publication of notices, authorized him to obtain the same at the most reasonable rates, and to employ any United States Deputy Surveyor to make the survey. It also empowered the Commissioner of the General Land Office to establish the maximum charges for such surveys and publications, and, in case excessive charges for publication, to designate any newspaper published in the proper district, and fix the rates to be charged; and to the end that he might be fully informed on the subject, the applicant was required to file with the local officers, for transmission to the Land Office, a sworn statement of all charges and fees paid by him for publication and surveys, with all fees and money paid such officers.

This section was intended, apparently, to protect applicants for mining patents from unjust charges for survey and publication, authorizing them in respect to the survey personally to contract with a deputy surveyor for his services upon such terms as they might agree upon, and the Land Office to control the cost of publications. This section was incorporated into the Revised Statutes as section 2334, and is still in force.

The "Mining Laws and Regulations," published by the Land Office, Oct. 31, 1881, after saying that Surveyors-General would, in pursuance of said section, "appoint as many competent deputies for the survey of mining claims as may seek such appointment, it being distinctly understood that all expences of these notices and surveys are to be borne by the mining claimants and not by the United States;" further says; "the system of making deposits for mineral surveys, as required by previous instructions, being hereby revoked as regards field work, the claimants having the option of employing any deputy surveyor within such district to do his work in the field." The Secretary of the Interior in his decision defines field work to be the surveyor's notes of hearings, distances, etc., in the field, or a determination on the land of its form, extent, position, etc., by means of certain measurements. This constitutes the survey, and it is in relation to such work that the applicant for patent is authorized to contract as he pleases, and in relation to which also the Land Office regulations revoke the former rule requiring a deposit with the Surveyor General, no such deposit being now required. The first decision rejected the application for survey, because the miner did not make a deposit, and is inconsistent with the regulations and erroneous under the law. The platting of the claim is no part of the survey, but shows only what the surveyor has done, and is office work, for which the regulations properly provide that the claimant must make a deposit. Under this decision of the Secretary, the applicant for mining patent may contract with any U. S. deputy surveyor for the field work in making the necessary survey; but the office work must be done by the Surveyor General. This case did not occur in this State, where it has been the custom to allow applicants to contract with the surveyor themselves, without interference from the Surveyor General.

Miners' Life-Saving Institution.

In England, it is stated by the Home Secretary, some 2,500 miners lose their lives every year by explosions, floodings and other accidents. No public effort has been taken to reduce the mortality, though some miners take all the precaution possible. A society has now been formed, however, which is called the "Royal National Miners' Life-Saving Institution," and which is promoted by many distinguished men. Its object is defined in its title. It is the intention to provide certain approved breathing apparatus for use in colliery explosions. To provide "refuges" for miners (Fenwick's or other system) and any other appliance for affording men shelter after explosions or in floodings, and for repairing sheltered headgear, or for clearing the ways destroyed by explosions at mines, in order to get at imprisoned miners expeditiously, whether in the workings or refuges; also to provide other suitable apparatus, appliance or means for saving life in explosions or the floodings of mines. To form a staff of volunteers selected from the brave miners at every colliery and mine in the United Kingdom to descend mines and rescue human life upon explosions, floodings or any other accidents or position of danger. To establish an ambulance corps, consisting of the miners at every colliery in the United Kingdom, who will always be trained ready to give first aid to the injured miners by explosions or any other causes, until the arrival of medical assistance. To give effect to any other apparatus, appliance or means to save human lives, such as by the advising of barometrical warnings to the collieries or stations of the institution, or through the press, and the placing of suitable barometers wherever desirable.

The institution is to be supported by voluntary contributions and donations from the colliery owners, iron, stone and other mine owners, working miners and the general public. They intend carrying on the good work until every colliery and other mine in the United Kingdom shall have been thoroughly equipped in life-saving apparatus and other means of rescuing suffering humanity. For daring deeds of miners and others, where lives have been saved or brave attempts made to save lives, although unsuccessful, at mines, the institution will confer honorary rewards in the form of medals or votes of thanks, and will also make liberal grants of money.

Bismuth.

The production of metallic bismuth in the United States has thus far been of no importance. The ores, which in small quantities at least, are widely distributed in this country, give promise that in the future the production of bismuth may become a regular industry. The metallurgical processes for the extraction of the metal from its ores are quite simple. Bismuth ores occur in many of the States and Territories on this coast. There is one important deposit in Utah. Some has been found near Phœnix, Arizona. The usual ore is sulphide. This ore is found in small quantities as a sulphide in a large proportion of the refractory ores of the Rocky Mountains, and in considerable quantities in certain rivers in Boulder and La Plata counties, Colorado.

There is a lode called the Bismuth Queen, not far from Golden, Col., which shows a vein of bismuth ore varying from two to eight inches in width, in which the metal occurs in the process of bismutite and bismuthinite, carrying sometimes as high as 80 per cent of metal. A telluride of bismuth called tetradymite has lately been identified in Arizona. Bismuth has been found also in this State, but it has not been worked to any extent to our knowledge.

MINING BUREAU.—We have received from Henry G. Hanks the third annual report of the State Mineralogist, which we shall notice more fully next week. It is largely devoted to the consideration of borax deposits.

An Improved Ore-Mill.

Some little time since we illustrated and described the ore pulverizer invented by Wm. I. Tustin, of this city. Guided by the experience gained in many months' active work, Mr. Tustin has made a number of improvements on his original design, and has patented them. One of the principal improvements is in regard to the construction of the trunnion of the cylinder or band upon one side, its connection and arrangement with the indicator-shaft, and the means for oiling the parts. The indicator-shaft is now supported entirely upon and within one trunnion, leaving the other free for entrance of ore from the hopper. By the peculiar construction devised in the overlapping of joints, etc., it is impossible for any grit to find its way to the journals. To lubricate the bearings the indicator-shaft is made hollow from its outer end where the oil cup communicates with it, to a point near its inner end, and small holes are drilled through the shaft to allow the ore from the hollow center to escape in order to lubricate the exterior of the shaft.

The man-hole plates and the screens are secured in a peculiar manner. A water-distributer is also supplied to discharge water on the screens to cleanse them, and passing through to wash the pulp or pulverized material out of the barrel.

To regulate the movement of the swinging hopper and the feed, means are provided for holding the hopper further from or closer in contact with the ratchet-cam, whereby the jar or concussion may be increased or diminished, or caused to cease altogether, and the feed stopped.

To do this there is a shaft, having on one end a cam, operating against the arm of the hopper. This shaft carries on its other end a wheel having a toothed periphery which is engaged by a spring pawl. By turning this wheel by means of a crank the cam forces the hopper in or out, regulating its swing, and consequently the feed. All these improvements relate to matters of construction whereby the parts work together to better advantage in accomplishing the result.

Lead Smelting Fuel.

The fuel used for lead smelting on this coast is either charcoal or coke or both mixed. In many places attempts at smelting with charcoal alone have failed. Most of the oak out here is poor, and hard charcoal from mahogany, cedar, etc., is also to be rejected for use on a blast furnace because it decrepitates into small particles, which have the same effect as coal slack or waste in chilling the slag through reduction of the temperature. Nut pine (pinon) makes the best charcoal, and this was formerly the principal fuel of Eureka. Charcoal from lighter woods such as yellow and white pine, Mr. O. H. Hahn tells us in his article on the subject of "lead," in a late government report, cannot be used alone without reducing the temperature of the furnace. The same authority says the best coke or the English patent coke is shipped annually from Cardiff to this port. It is porous and light and leaves a very small percentage of ash.

Owing to the different fusibility of different ores, the percentage amount of fuel must be referred to tons of charge in comparing the consumption of various localities. This brings out the remarkable fact that smelting at a high altitude requires more fuel than at a lower one. In Leadville, for instance, the consumption of mixed fuel amounts to from twenty-two to twenty-four per cent of the weight of the smelting mixture, which, in Salt Lake City, amounts to fourteen to seventeen per cent, the lower figure corresponding to the summer, and the higher to the winter season, when the ores absorb more moisture than in summer.

Where charcoal alone is used, it is said the percentage of fuel is somewhat higher, probably between twenty-six and twenty-eight per cent. It is always advisable, in the interest of regularity of furnace operations, to weigh not only ore and flux, but also the fuel, as accurately as possible.

MR. JOHN C. TAPPERINER, the inventor and patentee of the improved assaying furnace, was killed during the raid of roughs on the town of Bishee, Arizona, last week. He was assayer at a mine in the camp, but unfortunately was one of the victims of the cowardly attack made by the desperadoes.

An Improved Upright Drill Press.

The engraving on this page shows a new improved upright drill press, which is, in very many respects, a decided improvement in drill manufacture, and combines many important and desirable features. Its automatic drilling capacity is 24 inches, which, it is claimed, exceeds the ordinary 50-inch drill. This capacity extends the whole length of the column. In the case of many drills the face of the column projects from two to four inches beyond the lower part of the column, thus losing that much swinging space when long work is being drilled. The head of this drill is both automatic and adjustable, with rack and pinion, and can be placed any desired hight on the face of the post instantly, without the use of any bolts. The point of the drill is always the same distance from the head, thus avoiding any spring as in ordinary cases where there is a quill ten to twelve inches long. The bearing on the spindle is the same as that of head spindle to an engine lathe, and in case of wear can be taken up in the same manner. This enables the boring of a perfect hole. The manner in which the holes through the boxes for spindles, as well as the hole for table, are bored insures a perfect alignment, which is certain to bring all parts square when finally put together.

To obtain a quick return movement to head and spindle, the worm is not, as is usual, disconnected for the purpose of adjusting the head, but is connected and disconnected by means of a clutch, which is very conveniently operated, by pulling out and pressing in the lever or handle in front. To connect the gear with the shaft the lever is pulled out, to disconnect it is pressed in. The back gear shaft has a bearing at both ends, which makes it so much firmer than being supported at one end, as in ordinary cases. The feed cone on top shaft runs independent of the shaft, and is connected and disconnected by means of a lock plate and thumb screw, and when the power feed is not in use remains stationary without throwing off the belt.

The drill is made from the best of stock. It is well designed, well proportioned, and extra heavy, very stiff and powerful. The base and column are uncommonly large. The back brace is made from one solid piece, weighing more than 200 pounds. Weight of machine, 1,900 pounds. Swing, 24 inches. Greatest distance from base to spindle, 52 inches; greatest distance from table to spindle, 40 inches; face of column on which head slides, 7¼ inches wide; head is 12 inches long, and has a bearing the entire length. Automatic feeding capacity, 24 inches; diameter of spindle, 1¾ inches, with 1¼ inch bearing in head box. Vertical movement of head and spindle, 24 inches; vertical movement of table, 22 inches. That portion of the table which rests upon the arm has a bearing surface seven inches diameter.

The cones are large, have wide sections using three-inch belts, and are placed as far apart as possible, using long belts, which adds power to the machine. The driving pulleys are 12x4 inches, and should make 200 revolutions per minute. The drill is for sale by Parke & Lacy, Nos. 21 and 23 Fremont street, S. F., sole agents for the coast, who should be addressed for further information. A 26-inch drill is also made of the same type, to which the same general description applies.

A Rich Copper Region.

The entire range on the northern side of Soda Springs Valley, near Luning, Nevada—some twenty miles in length by ten miles wide—is prolific in copper deposits, many of which are true-running contact lodes of unusual magnitude and promise, though not as yet proven to any considerable depth.

The ores are, in the main, high grade and of easy smelting quality, being mostly red and black oxides, carbonates and silicates, with but rarely admixtures of sulphides.

There is generally at or near the mines water sufficient for camp purposes; and the claims are of easy access from the railway stations in the valley through the *arroyos* which cleave the range, and afford natural roadways of easy grades.

Water for smelting operations may be found anywhere near Luning at a depth of 60 or 70 feet, or may be brought by pipe-line from adjacent mountains.

Blasting in Mines—No. 17.

Directions for Using Vulcan Powder.

Vulcan powder is a nitro-glycerine compound, largely used on this coast. Three grades are made by the Vulcan Powder Co., of this city. No. 1 is for very hard rock, bowlders, iron, etc. No. 2 is for sinking and drifting in medium hard rock, sandstone, limestone, etc. No. 3 is for bench work, pipe-clay, cement, soft and shelly rock, quarrying, etc. A low grade powder called "Vulcan B. B.," is also made for use in rock such as bank blasting, railroad cuttings and grading. It is a dry, granulated powder, composed of ingredients similar to those of ordinary black powder and contains no nitro-glycerine or chlorate of potash. It does not freeze, nor being affected by temperature.

The following directions for the use of Vulcan powder are those issued by the manufacturers. At times it may be expedient to vary from set rules, but under ordinary circumstances it will be best to adopt a system that has found favor with the most experienced miners.

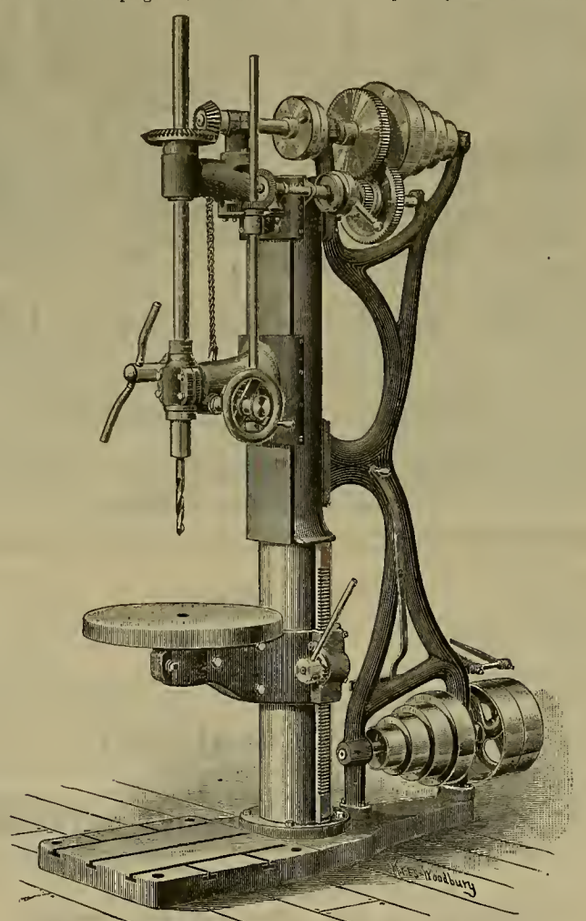
In charging a hole, ram each cartridge "well home with a wooden tamping bar; cut the end of the fuse square; push the cap on it until it reaches the fulminate, then nip the cap tight to the fuse with a pair of nippers. In wet holes, rub some grease or soap around the cap to make it air and water tight on the fuse. The cap must be squeezed tight to the fuse to insure a perfect blast. If loosely put on, the explosion may not be complete. Use a priming cartridge (this is about an inch and a half or two inches of cartridge, into which the cap with fuse attached is inserted), and let this priming cartridge down the hole until it rests on the powder. Then tamp with water, sand or clay, or use no tamping, as you think best. Vulcan powder is equally effective in wet or dry holes. The explosions of Nos. 2 and 3 Vulcan is rendered more effective by using a priming cartridge of No. 1.

On account of its strength, excellent execution is done with Vulcan powder without tamping it. However, when well tamped more work is done, the amount of power gained being in proportion to the excellence of the tamping. It is advisable to tamp the first four or five inches lightly. Tamping also produces a more complete explosion, and hence lessens the quantity of fumes.

Vulcan powder freezes at about forty-two degrees Fahrenheit, and gradually becomes hard. In this condition it cannot be exploded with the blasting caps. If not already frozen when received at a mine, it should be kept in some warm place where it cannot freeze, to save the trouble of thawing it. Powder should never be used for blasting when frozen. If it should freeze when in a drill hole, it can be exploded by using a heavy primer of well thawed Vulcan powder. Never, under any circumstances, attempt to pick out a charge of frozen powder from a drill hole; it is always attended with some danger.

To thaw frozen Vulcan powder, use the Vulcan powder thawing box as follows: Place a funnel in the hole at the top of the box, and fill the outside case with hot water; then put powder into the center chamber, and screw down the top. If, after two hours, the powder is still frozen, change the water, again putting in hot water. Keep the center chamber clean.

The "Vulcan B B," of which we have spoken above, should be used in exactly the same way as you would ordinary black powder. "Vulcan B B" can be exploded with an ordinary fuse. No cap is required. In drill holes the powder must be well confined and thoroughly tamped to secure good results. Tamp the powder itself before putting in the tamping. In drill holes, it is highly important to tamp the powder itself perfectly solid with a modern tamping bar before putting in the tamping. The Vulcan Powder Company, 218 California street, in this city, will give full particulars regarding their various grades of powder to those desiring it.



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Publishers' Card.

The undersigned return their most sincerely appreciative thanks to MR. AND MRS. CHAS. G. YALE for the exceedingly recherche reception tendered them on the twentieth anniversary of the firm of Dewey & Co., at the former's pleasant home in Oakland, last Saturday evening. It was doubly enjoyed for its substantial character and the kindly spirit and graceful manner in which it was presented throughout. Mr. Yale's long-continued and pleasant association as a co-laborer with our firm, renders this personal recognition a more than ordinarily pleasant acknowledgment.

A. T. DEWEY.
Dec. 15, 1883. W. B. EWER.

THE trails to the Cœur d'Alene mines are almost impassable, the snow is so deep,

The Red Sunsets.

The peculiar appearance of the sky just after sunset—which we have all noticed of late—appears to prevail all over the country, being by no means local, as was at first supposed. It is noticed in the Eastern and Southern States as well as in the West. On another page we print a communication on the subject which will repay perusal. At the last meeting of the California Academy of Sciences the subject of the bright, reddish glow in the Eastern and Western heavens near sunrise and sunset was adverted to, and the President, Prof. Davidson, made the following general statement:

Supposing that the red sunsets and sunrises might be possibly owing to a large amount of moisture in the atmosphere, I examined the western sky with the spectroscope, and could see no indications of any unusual amount of aqueous vapor; but continuing to watch the changes of the glowing red some time after the sun had set, I saw that this red glow existed only where there were pronounced streaks of moderately thick smoke. The outlines and the intensity of the glow conformed to the outline and density of the smoke currents. As a light northerly air blew the smoke to the southward, the northwestern part of the horizon lost its glow, but that to the southwest continued.

This effect of the smoke was not the same as if a great dense atmosphere of smoke pervaded the air for miles seaward as we frequently have it from the fires of the Oregon forests, when the sun appears red, even as far south as Cape San Lucas and the Sandwich Islands, and actually sets almost obscured. In this red glow Venus shone conspicuously bright and white every evening through the red.

It will be remembered that there had been little or no wind about the peninsula and bay of San Francisco; the smoke from its thousand factories and engines settled over the city and bay, and moved but little in any particular direction. From my observatory I could, at times, not see Mission bay on account of the density of this smoke. At the same time we knew we had large forest fires on the coast, and especially to the southward. Capt. Lawson, of the Coast Survey, writes from the mountains on the seaboard near San Luis Obispo, that he has the same red sunsets and sunrises, but does not assign any cause.

It has been asserted that probably the pumice ashes from the newly-formed volcanic island of Bogostov, north of Unalaska, in latitude 53° 57′ and longitude 167° 50′, have been carried through the atmosphere to this coast, and caused this peculiar sun effect. But Captain Anderson had some trouble in gathering two small vials of the pumice stone ashes at Illioulioukorg, forty miles east of Bogostov, whereas we are 1,500 miles therefrom. Moreover, neither Captain Anderson nor Captain Hague, who passed close to the new volcano when the sky was charged with the smoke, steam and pumice stone ashes, report any peculiarity of the sunsets in that region. Nor have we any such report from the region of Java after the August volcanic eruption.

If there is any pumice ashes, or any meteoric dust to occasion a universal red sunset or sunrise, we should be able to detect it on the snows of the Sierra Nevada, or other snow ranges.

So far as my experiments and observations guide, the cause in this vicinity was solely the local distribution of the smoke.

Collecting Flue Dust, No. 4.

After the first trial the hanging plates were introduced into Sections VI, VII, and VIII, a section of which is shown at Fig. 11. They were then introduced on a much larger scale in Sections V, VI, VII, VIII, and IX, as shown in Figs. 16 and 17. [See PRESS of Dec. 1, page 353.]

The method of hanging-in the sheet-iron consists in placing a rectangular bar of iron, which has been pierced with the requisite number of holes, on its edge, in the spring of the arch, if the arched form of the flue is used, or at the proper hight in the rectangular ones. This bar is twisted flat at its ends so as to enter the wall about 3 cm. Iron pins, 10 cm. between centers, are driven into the holes, projecting 3 to 4 cm. on both sides. A piece of iron, D, Fig. 17, bent to form a hook, is riveted upon the ends of each sheet, so that it simply drops on to the pins, and hangs at each end supported in a vertical position. So arranged, the sheets can be put up or taken down with the least possible trouble. To simplify the construction, a punching machine is used which pierces two holes at once in the sheet-iron at the proper distance from the edge. The iron which forms the hook L, Fig. 17, is punched in the same way. The riveting is done with two or three blows of the hammer. When the sheets are hung upon the pins they fill up the flue, and have between them in the direction of the length of the flue only the thickness of the iron bars on which they rest. These sheets do not make any perceptible reduction of the total volume of the flue, but they increase the condensation surface enormously.

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Ingersoll, D2 3", beat Rand 3½"	.744	" "
Ingersoll, D2 3", beat National 3½"	.505	" "
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National beat Rand	.139	" "

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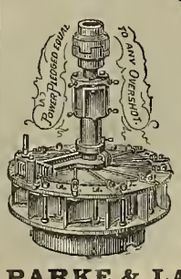
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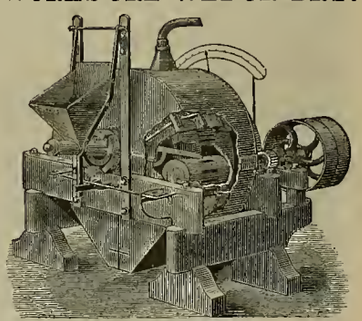
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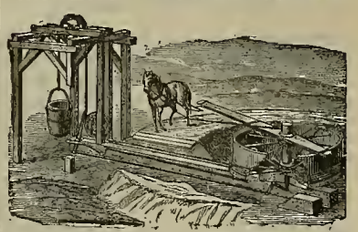
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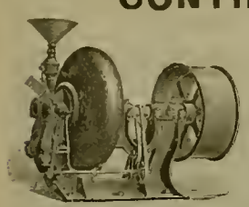
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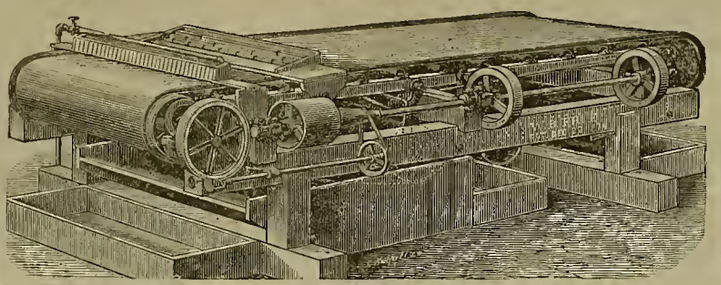
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To those intending to manufacture or purchase the so-called "Triumph" Concentrator, we borowith state:

That legal advice has been given that *all shaking motion* applied to an *endless traveling* belt used for concentration of ores is an infringement on patents held and owned by the Frue Vanning Machine Company
That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.
That the patent laws make *users* of infringements responsible as well as makers, and the public is therefore warned that there is considerable risk in purchasing any end-shake machine until our various patents have been decided.
That if there are those who for any reason prefer an end-shake machine, we can manufacture and sell to such machine of that description, as efficient as the Triumph, and at a lower price, and no liability for infringement will then be incurred by the purchaser.
That we shall protect ourselves against any one making, selling or using any machine infringing any of our patents. Patented July 9, 1867; May 4, 1869; Dec. 22, 1874; Sept. 2, 1879; April 27, 1880. Patents applied for.
That we are, and have been, ready at any time, to make a competitive trial against the Triumph, or any other machine, for stakes of $1,000.

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Nov. 6, 1882.

William Hawkins.

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F

FOR WEEK ENDING DEC. 4, 1883.

289,598.—SADDLE GIRTH—A. Ayers, San Jose, Cal.

289,793.—BELT REPLACER—Geo. W. Emerson, Oakland, Cal.

289,525.—BOOT—B. Geileson, S. F.

289,409.—MANUFACTURE OF MATTRESS STUFFING—F. Hagedorn, S. F.

289,705.—LOCOMOTIVE COW CATCHER—Wm. Phillips, Marshfield, Or.

289,559.—PUMP AND WATER-WHEEL—Sam'l S. Richardson, Happy Camp, Cal.

289,560.—WATER MOTOR—Sam'l S. Richardson, Happy Camp, Cal.

289,450.—SPRING BALANCE COUNTER SCALE—F. W. Runge, S. F.

289,719.—DEVICE FOR SECURING WHEEL TIRES—L. Shelton, Santa Rosa, Cal.

289,576.—SAW TOOTH—Eugene Smith, S. F.

289,791.—DRY ORE PULVERIZER AND CONCENTRATOR—Adam Wingard, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise), at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through DEWEY & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of speeial mention:

DIRT SCRAPER.—James Porteous, Fresno, Cal. No. 289,134. Dated Nov. 27, 1883. These improvements in scrapers for leveling land consist in the means for regulating the dump of the bowl. The object in this is to cause the bowl to discharge the load more or less quickly by regulating the distauce of its bit from the ground when in the dumped position. In case of a decided depression in the ground, it becomes necessary to discharge the load at once, and this is accomplished by so regulating the dump of the bowl that its bit shall be high enough from the ground to let the dirt escape. In case but a thin layer need be spread, the bit is raised but little and it acts as a scraper, spreading the slowly-discharging earth over a greater surface. This result, namely, the limiting of the dump of the bowl, has been heretofore accomplished by means of a bar set trausversely over the top between the ends of the bowl, said bar coming in contact witb the draft rods; but the present construction overeomes any objections there may be to the previous method.

KEY-SEAT CUTTING MACHINE.—Geo. W. Bonds, S. F. No. 289,060. Dated Nov. 27, 1883. This is an improvement in that class of machines for cutting or slotting keyways in wheels, pinions, pulleys, etc., where the wheel is made with teeth or cutters on the edge, like a milling tool, and of the exact width of the slot to be cut. It consists of a moving table provided with suitable adjustable jaws and slots and slots for fastening the work to be operated upon, and both hand and automatic feeding attachments to move the work to the cutter, instead of feeding the cutter to the work, as is eustomary in this class of machines. An automatic relief motion is provided to save the wear of the cutter ou the back stroke, as is also an automatic stop to gauge the cut to any desired depth. The eutter and cross-bead are provided with adjustmeuts to fix the taper at any desired angle, and they are locked with adjustable steel rollers below and above the cut to prevent springing, thus making tbe keyway exactly straight.

CABLE-GRIP.—Beujamin F. Carman, S. F. No. 288,960. Dated Nov. 20, 1883. This is a new form of grip for eable-railroad cars, by which the car and eable are connected and dis connected at pleasure. The invention consists in a grip having flexible or pointed jaws, means for retaining the cable between the jaws when partially opened, and a peculiar lever and pawl mechanism for operating the jaws to grip or release the cable.

DESIGN FOR WIRE FENCE.—Gaspar Hunziker, Cloverdale, Sonoma Co. No. 14,442. Dated Nov. 27, 1883. The design consists in the combination of two or more nettings with different sized meshes. The leadiug feature of the design consists of a series of parallel horizontal sections of nettiug, haviug meshes of different sizes, said sectious being united at their cdges so as to form a panel.

PUMP.—Clarence T. Fouts, S. F. No. 289,079. Dated Nov. 27, 1883. This consists of an improved force pump, the air chamber, ingress and egress valves and plungers of which are located within a containing-case or chamber of larger diameter.

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ASSESSMENTS.

COMPANY.	LOCATION.	No.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alta S M Co	Nevada	27	25	Dec	1 Jan	4 Dec	20 B Burris	309 Montgomery st
Andes S M Co	Nevada	23	25	Nov	10 Dec	20 Jan	9 B Burris	309 Montgomery st
Baker Divide M Co	California	8	20	Dec	5 Jan	7 Jan	28 W G Hughes	330 Pine st
Boston Con M Co	California	5	25	Nov	21 Dec	24 Jan	14 F E Luty	330 Pine st
Bullion M Co	Nevada	28	20	Nov	16 Dec	18 Jan	7 J N Brazell	320 Montgomery st
Bodie Tunnel Co	California	3	15	Nov	1 Dec	7 Dec	27 C C Harvey	309 California st
Benton Con M Co	Nevada	11	10	Nov	1 Dec	6 Dec	24 W H Watson	302 Montgomery st
Buena Vista Petroleum Co	California	31	25	Oct	30 Dec	5 Dec	27 L Kennani	220 Sansome st
Caledonia M Co	Dakota	14	10	Oct	21 Dec	13 Jan	11 W L Oliver	328 Montgomery st
Columbus Con M Co	Nevada	1	25	Nov	5 Dec	10 Jan	3 J M Buffington	309 California st
Day S M Co	Nevada	14	30	Dec	1 Jan	7 Feb	5 E M Hall	327 Pine st
El Dorado Con M Co	Nevada	1	05	Dec	4 Jan	7 Jan	23 J H Sayre	330 Pine st
Eureka Tunnel Co	Nevada	2	50	Nov	9 Dec	10 Jan	11 J Pardy	Eureka, Nevada
Gould and Curry S M Co	Nevada	46	50	Nov	7 Dec	12 Jan	3 A K Durbrow	309 Montgomery st
Gold Lead M Co	Nevada	4	5	Nov	9 Dec	17 Jan	8 J Bronzan	326 Montgomery st
Hale & Norcross M Co	Nevada	79	50	Nov	17 Dec	21 Jan	14 J F Lightner	309 Montgomery st
Independence M Co	Nevada	12	20	Dec	1 Jan	4 Jan	28 J W Pew	310 Pine st
Loreto M and M Co	Mexico	5	50	Dec	5 Jan	7 Jan	24 H G Jones	327 Pine st
Massachusetts Con M Co	California	1	10	Dec	4 Jan	12 Jan	31 A C Hammond	Merchants Ex.
Mayflower Gravel M Co	California	21	10	Nov	26 Dec	27 Jan	15 J Morizio	328 Montgomery st
McElroy Gravel M Co	California	11	25	Oct	25 Nov	30 Dec	26 J T Fogarty	306 Montgomery st
Northern Belle	Nevada	1	50	Nov	30 Jan	1 Jan	28 W Willis	309 Montgomery st
Original Keystone M Co	Nevada	7	30	Nov	21 Dec	22 Jan	10 F E Luty	330 Pine st
Savage M Co	Nevada	27	50	Nov	3 Dec	7 Dec	27 E B Holmes	309 Montgomery st
Wide Awake M Co	Arizona	17	20	Nov	17 Dec	25 Jan	28 C Hildebrandt	320 Sansome st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Bechtel Con M Co	California	W H Leut	309 Montgomery st	Annual	Dec 17
Eiko Con M Co	Nevada	F (Sperling	309 California st	Annual	Dec 17
Gould & Curry M Co	Nevada	A K Durbrow	309 Montgomery st	Annual	Dec 17
Gorilla M Co		A A Enquist	436 Montgomery st	Annual	Dec 26
Mountain M Co		B E Henrickson	213 Mission st	Annual	Jan 7
Mt. Diablo M Co	Nevada	R W Heath	318 Pine st	Annual	Dec 19
Ophir M Co	Nevada	C L McCoy	309 Montgomery st	Annual	Dec 19

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Bulwer Con M Co	California	W Willis	309 Montgomery st	15	July 2
Idaho M Co	California			4.00	Dec 2
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	Nov 19
Mt Diablo M Co	Nevada	R W Heath	318 Pine st	25	Nov 26
Standard Con M Co	California	Wm Willis	309 Montgomery st	Two of 25	Dec 12
Silver King M Co	Arizona	J Nash	315 California st	25	July 12

Mining Share Market.

No event of importance has occurred to stir up the share market sufficiently to attract special attention to its doings. They are working away on the Comstock trying to find a bonanza, but none has come to light for a long time. At Gold Hill the Yellow Jacket folks are now extracting 120 tons of ore per day, or over 800 tons per week. The Belcher, Crown Point and other companies are taking out a'l the ore the mills can crush in the present low stage of water in the Carson river. The Alta folks have the water out of their mine nearly down to the 2150 level. As the pumps are now drawing the water from about 3,000 feet of drifts, progress is at present rather slow. The draining of the Alta will allow of work being resumed in the Benton, and the Justice folks will also doubtless resume operations, drifting into their ground from the Alta, as they had arranged to do before the flooding of the latter mine. The Hale and Norcross folks are sinking the winze below the 2700 level at the rate of 20 feet per week. They will continue to work on this winze until the starting up of the new hydraulic pump enables them to resume explorations on the 2700 level. The connections for the new pump (at the 2400 level) are now in, and the whole machinery of the pump is on the ground ready to be lowered and put in place at the 2600 level. With the starting of this pump work will be resumed on the 2600 level of the Chollar-Potosi.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties conneeted with the interests specially represented in its columns. Persons so receiving eopies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in tbe cause it faithfully serves. Subscription rate, $4 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turning a leaf.

Bullion Shipments.

Richmond Consolidated, December 4th, $13,918; Paradise, 3d, $2,323; Hanauer, 4th, $6,770; Stormont, 4th, $3,300; Idaho, 4th, $9,000; Vienna, 4th, $10,739; Ontario, 4th, $10,321; Horn Silver, 4th, $21,000; Salmon City (Idaho), dust, 4th, $9,000; Vienna, 5th, $5,290; Ontario, 5th, $4,221; Horn Silver, 5th, $6,000; Hanauer, 5th, $2,322; Crescent, 6th, $1,540; Hanauer, 6th, $4,389; Vienna, 6th, $1,550; Ontario, 6th, $3,816; Horn Silver, 6th, $6,000; Ontario, 7th, $4,105; Horn Silver, 7th, $12,000; Hanauer, 7th, $4,500; Stormont, 7th, $1,950; Hanauer, 8th, $4,760; Nevada (ore), 8th, $1,850; Vienna, 8th, $3,04‡; Ontario, 8th, $4,066; Horn Silver, 8th, $9,000; Alice, 9th, $12,734; Ontario, 9th, $3,952; Horn Silver, 9th, $15,000; Contention, 2d, $15,113; Mt. Diablo, 3d, $8,804; Standard, 3d, $16,324; Navajo, 10th, $10,000; Northern Belle, 4th, $6,593; North Belle Isle, 10th, $2,000; Grand Prize, 10th, $7,000; Belmont, 2d, $1,629; Christy, 10th, $2,491; Contention, 8th, $14,052.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receivi ng accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Nov. 21.		WEEK ENDING Nov. 27.		WEEK ENDING Dec. 5.		WEEK ENDING Dec. 12.	
Alpha	1.05	1.35	1 65	.70	.90	1.00	1.05	
Alta	1 00	1 25	1.05	1.35	.75	1.05	.95	1.35
Andes	.35	.40	.40	.55	.20	.30	.20	.50
Alhion		.40						.10
Argenta		.10						.05
Atlas								
Belcher				.80	.80	.90	.90	1.05
Belding								
Best & Belcher	3.00	3.35	2.65	3.55	2.25	2.75	2.00	3.00
Bullion	.45	.50	.40	.65	.20	.25		.30
Bechtel								
Belle Isle	.35	.40		.30		.30		.30
Bodie Con	.35	.50	.30	1 25	.75	.95	.75	.90
Benton	.05	.10	.05	.15	.05	.15	.15	.25
Bodie Tunnel		.20						.35
Caledonia		.15				.15		.15
California		.25		.25	.15	.25	.15	.25
Challenge		.35				.15		
Chollar	1.65	2.05	1.65	2.05	1.55	1.90	1.70	2.25
Confidence	1.30	1 50	1.10	1.60	.70	.90	.80	.85
Con. Imperial		.05						.05
Con. Virginia	.40	.45	.35	.45	.25	.35	.30	.35
Crown Point	.85	.95	.80	1.00	60	.75	.90	1.10
Day				.40		.30		
Eiko Con		.20		.20		.20		.10
Eureka Con		3.85	3.50	4.10	2.95	3.45	2.75	3.50
Eureka Tunnel								.55
Exchequer	.35	.40	.30	.40	.20	.30	.30	.40
Grand Prize	.25	.30	.25	.35	.20	.30	.25	.30
Gould & Curry	1.25	1.50	1.10	1 50	.85	1 15	.80	1.80
Hale & Norcross	1.35	1.60	1.05	1 80	.70	1.10	.85	1.30
Hines			.30	1.00	1.00	1.10		
Independence								
Julia								.05
Justice		.25	.20	.25	.15	.25	.25	.35
Jackson								
Kentuck								
Martin White		.25						
Mono			.40	.50		.15		
Mexican	2.25	2 70	2.20	2.80	1.70	2.30	1.90	2.50
Mt. Diablo	3.00	3.25		3.25	2.60	3.10	2.75	2.90
Mt. Potosi								
Noonday								
Northern Belle	3.90	5.90		2.00	.80	1.40	.15	.50
North Noonday								
Navajo	3.70	3.75	3.80	3.90	3.70	3.75	3.25	3.65
North Belle Isle		.50		.50				
Occidental	1.00	1.20	.70	1.20		.75	1.70	1.95
Ophir	3.70	3½	3.60	5.75	5.75	5½	7.00	8.50
Overman	.20	.25		.20		.15	.20	.35
Oro								
Potosi	.60	.65	.65	.75	.50	.80	.75	1.05
Pinal Con								
Savage	.50	.60	.30	.70	.15	.70	.70	1.00
Seg. Belcher								.25
Sierra Nevada	3.20	3.65	2.50	3.85	2.15	2.70	2.25	3.85
Silver Hill								
Silver King		7.75		7.00	7.75		7§	
Scorpion		.50	.40	.50	.35	.40	.35	.50
Tuscarora								
Union Con	2 60	2.70	2 65	3.65	2.20	2.80	2.40	3.40
Utah	2.20	2.30	1.40	2.05	1.05	1.60	1.25	1.85
Ward								
Wales				.25	.20	.30	.20	.25
Yellow Jacket	2.30	2.90	2.05	3.15	1.50	1.95	1.60	2.20

Sales at San Francisco Stock Exchange

THURSDAY A. M., Dec. 13.

560	Alta	1.25@1.30	
190	Bodie Con	.75c	
100	Chollar	2.15	
500	Elko Con	.05c	
45	Eureka Con	.3‡	
300	Exchequer	.35@40c	
400	Grand Prize	.25c	
365	Hale & Nor	1.10@1.15	
400	Justice	.20c	
285	Mexican	2.15@2.20	
100	Northern Belle	.20c	
50	Navajo	3.40	
90	Overman	.25c	
1370	Ophir	.9‡@10	
560	Sierra Nevada	3.10@3‡	
60	Utah	1.65	
625	Union Con	2.95	
125	Yellow Jacket	2	

AFTERNOON SESSION.

525	Alta	1‡@1.30
100	Argenta	.05c
100	Bodie	.75c
200	Bodie Tun	.35c
160	Best & B	2.65@2.70
150	Chollar	2.05@2.10
130	Con. Virginia	.30c
20	Confidence	1.1
150	Eureka Con	3.20@3‡
250	Gould & Curry	1.60
20	Grand Prize	.25c
320	Hale & Nor	1.10@1.15
100	Independence	.10c
100	Justice	.20c
100	Mexican	2.05@2.10
50	Mt. Diablo	2.40
900	Northern Belle	.15@.20c
40	Ophir	.72
30	Occidental	1.10
100	Overman	.25c
80	Potosi	.80c
500	Savage	.90c
265	Sierra Nevada	3.05
10	Scorpion	.35c
150	Union	2.85
50	Utah	1.50

Job Press for Exchange.

We have just received a new improved Rotary Job Printing press of approved style and make, which we will sell at a bargain or exchange on favorable terms for a Washington hand press. Size of chase inside 7x10 inches. DEWEY & Co., publishers.

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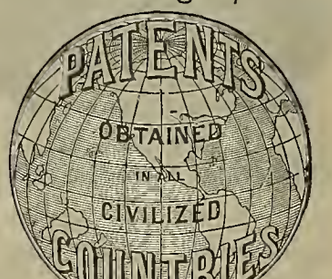
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Addresses. Business letters should be addressed and drafts made payable to DEWEY & Co.

NEVADA COUNTY BULLION.—The Nevada City (Cal.) *Transcript* says: The shipments of gold bullion through Wells, Fargo & Co.'s Express office at this city during November amounted to $125,000, or $8,000 more than for the corresponding month of last year. We hope that our exchanges in condensing this item will not give the above figures as the month's production for all of Nevada county, which is a mistake they often make. The office at this city is only one of five in the county that gold is being sent through all the time, and the total gold yield of the county has been upward of $3,500,000 per annum for several years past. Our Handbook of Nevada County, which is now being printed, gives some valuable information on this point.

NEW AGENCIES.—The new firm of Coit & Folsom, No. 10 California St., in this city are now the selling agents for the Reading Iron Works, wrought iron pipe, boiler tubes, etc., the A. Burritt Hardware Co., malleable and cast iron fittings; Reading, Bolt and Nut Works, bolts, nuts, boiler rivets, etc.; and A. H. McNeal cast iron, water and gas pipe. The firm also furnish prompt quotations for the Central Iron Works, boiler and tank iron; and the Pencoyd Iron Works, structural and shapo irons. All these various establishments rank high in their specialties, and this is the first time some of them have been represented on this coast.

COEUR D'ALENE means the iron or steel-hearted, and was first given to the savages of that region because of their peculiar implacability.

San Francisco Metal Market.

[WHOLESALE.
THURSDAY, Dec. 13, 1883.

ANTIMONY—Per pound	14 @ 15
IRON—American Pig, soft, ton	30 00 @ —
Scotch Pig, ton	24 00 @28 50
American White Pig, ton	28 00 @32 50
Oregon Pig, ton	— @ —
Clipper Gap, Nos. 1 to 4	32 50 @35 00
Refined Bar	3½@ 3¾
Horseshoes, keg	5 50 @ —
Nail Rod	7½@ —
Norway, according to thickness	6½@ 7
STEEL—English Cast, lb	14 @ 15
Black Diamond, ordinary sizes	14 @ —
Drill	15 @ 16
Machinery	12 @ 14
COPPER—Ingot	22 @ —
Bradley sizes	31 @ —
Fire-box sheets	31 @ —
Nails	17 @ —
Bolt	31 @ —
Old	8 @ —
Bar	@ —
Cement, 100 fine	15½@ —
LEAD—Pig	4½@ 4¾
Bar	5½@ 6
Pipe	7 @ —
Sheet	8 @ —
Shot, discount 10 % on 500 bags; Drop, ¾ bag	2 10 @ —
Buck, ¾ bag	2 30 @ —
Chilled, do	2 50 @ —
TIN PLATES—Charcoal	6 00 @ 6 50
Coke	5 50 @ 5 75
Banca Tin	24 00 @ —
Australian	21 50 @ —
I. C. Charcoal Roofing, 14x20	6 50 @ 6 80
ZINC—By the cask	1¾ @ —
Sheet, 7x3 ft, 7 to 10 lb, less the cask	9 @ 10
NAILS—Assorted sizes	3 30 @ 4 75
QUICKSILVER—By the flask	34½@ 37½
Flasks, new	1 05 @ —
Flasks, old	85 @ —

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NOTICE OF ASSESSMENT.

The Land Purchasers' Association.—Location of principal place of business, San Francisco, Cal.

NOTICE IS HEREBY GIVEN, that at a meeting of the Board of Directors, or Trustees, held on the 5th day December, 1883, an assessment of five dollars ($5.00) per share (being balance of 44th and part of 45th installments) was levied upon the capital stock of this corporation, payable immediately to the Secretary at the office of the Company, 318 Montgomery St., San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 7th day of January, 1884, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on TUESDAY, the 12th day of February, 1884, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors.

EDWARD P. GRAY, Secretary.

OFFICE—318 Montgomery St., San Francisco, Cal.

N. B.—This Assessment is to pay the taxes on the property of the Association for the current year.

Mining Companies.

Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

DIVIDEND NOTICE.

OFFICE OF THE

Silver King Mining Company.

San Francisco, December 4, 1883.

At a meeting of the Board of Directors of the above named company, held this day, a Dividend (No. 43) of twenty-five cents (25c.) per share was declared, payable on SATURDAY, December 15, 1883. Transfer books will close December 8, 1883.

JOSEPH NASH, Secretary.

OFFICE—Room 19, Safe Deposit Building, 328 Montgomery Street, San Francisco, Cal.

REGULAR DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company.

San Francisco, December 1, 1883.

At a meeting of the Board of Directors of the above named company held this day, Dividend No. 61, of twenty five cents (25c.) per share, was declared, payable on WEDNESDAY, December 12, 1883, at the office in this city, or at the Farmers' Loan and Trust Company, in New York

WILLIAM WILLIS, Secretary.

OFFICE—Room No. 29, Nevada block, No. 309 Montgomery street, San Francisco, Cal.

EXTRA DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company.

San Francisco, December 1, 1883.

At a meeting of the Board of Directors of the above named company held this day, an extra dividend (No. 62) of twenty-five cents (25c.) per share was declared, payable on WEDNESDAY, December 12, 1883, at the office in this city, or at the Farmers' Loan and Trust Company in New York. WILLIAM WILLIS, Secretary.

OFFICE—Room No. 29, Nevada block, No. 309 Mon gomery street, San Francisco.

ASSESSMENT NOTICE.

Gould and Curry Silver Mining Company.

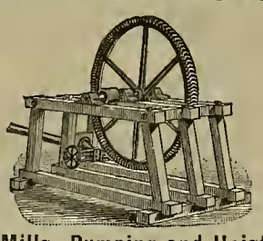
ASSESSMENT No. 46.

Levied	November 7, 1883
Delinquent	December 12, 1883
Day of sale	January 3, 1884
Amount	Fifty cents per share.

ALFRED K. DURBROW, Secretary.

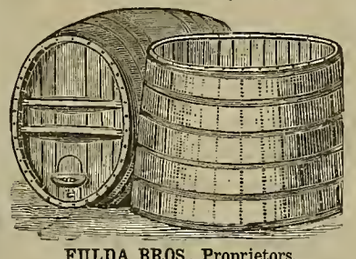
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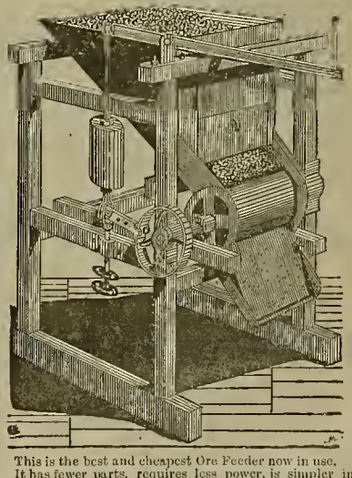
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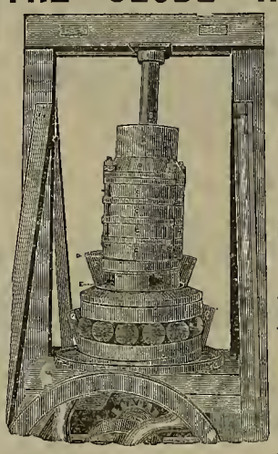
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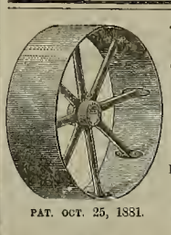
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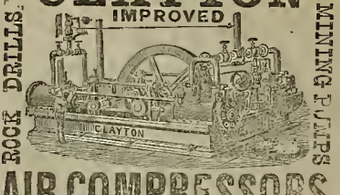
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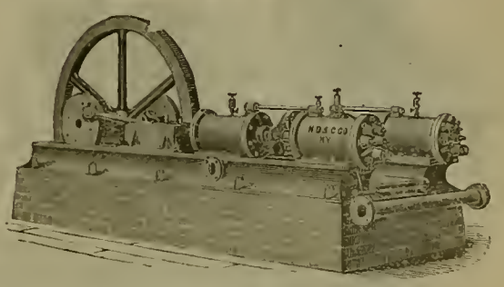
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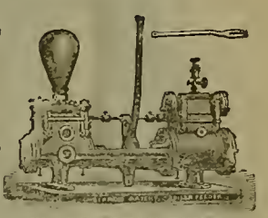


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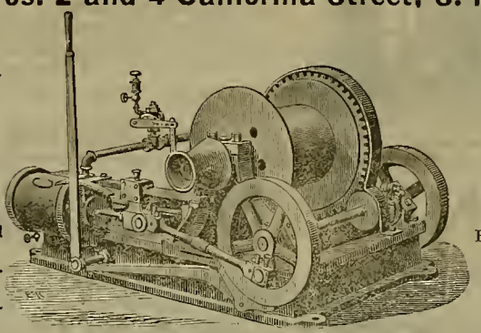


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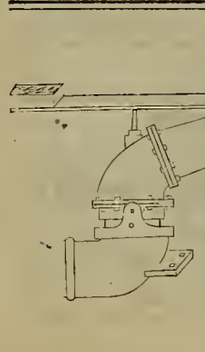
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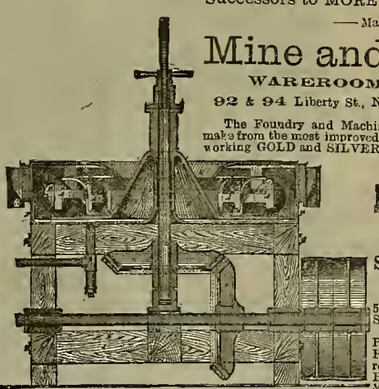
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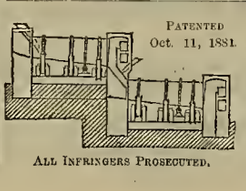
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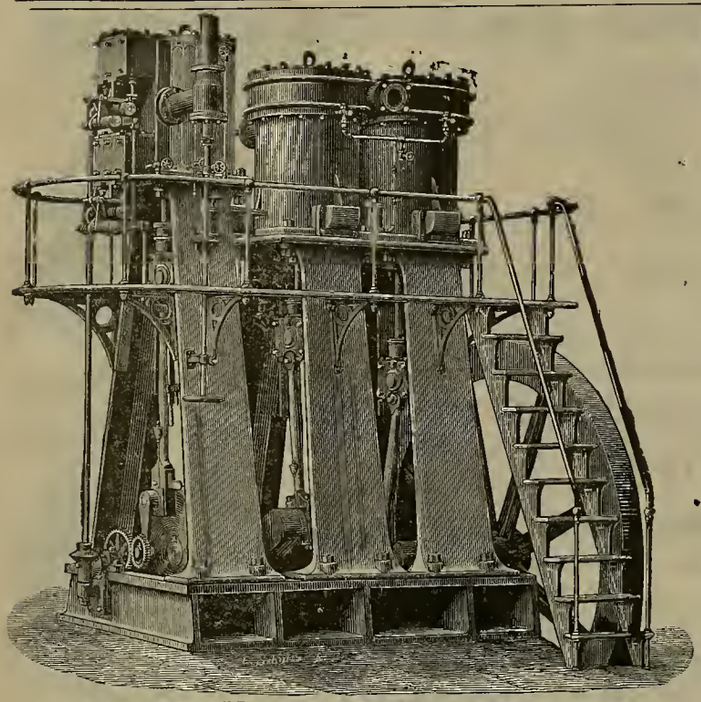
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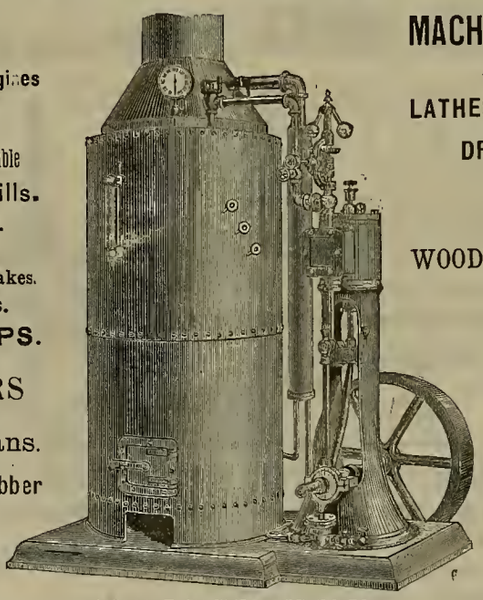
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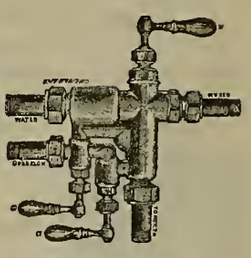
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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, DECEMBER 22, 1883.

VOLUME XLVII Number 25.

The Mining Bureau

State Mineralogist H. C. Hanks has sent to the Governor his third annual report for the year ending June 1, 1883. The actual report only occupies some 26 pages; but there is a very exhaustive "Report on the Borax Deposits of California and Novada," giving the production, consumption, uses, history, chemistry and mineralogy of boracic acid and its compounds, and other general information, with a map showing the principal localities in the two States. This portion of the report is illustrated, and occupies upwards of 100 pages. We shall refer to it more fully on another occasion.

In the report proper, Mr. Hanks gives a list of donors whose contributions have been entered on the catalogue. The donation to the museum and library have been of universal interest, and many of them of great value.

The importance of complete analyses of ores, minerals, mineral waters, building stones, rocks, limestones, cements, fertilizers, etc., laboratory experiments bearing on the working of complex ores, and a careful study of low-grade ores, and those requiring concentration, is fully realized by the State Mineralogist; and a course of such work was early planned, the results of which it was hoped would form an interesting and important part of the annual reports.

Owing to the forced closing of the laboratory and discharge of the chemist, there is but little chemical work to report. Many examinations of minerals have been made by the State Mineralogist personally, and information sent to those asking it; but this class of work has not been done to the extent it should be, for reasons set forth. A number of analyses of coal from newly discovered localities, and of ores and minerals, in a few cases have been made; but the meager results have been reserved for future publication. The books of the Bureau show a deficiency of $3,864 for it this year, which has been advanced from time to time by Wells, Fargo & Co. Every economy has been practiced, but Mr. Hanks states that had it not been for the liberality of the company the institution would have been compelled to close its doors.

It has become apparent that it was a mistake to appropriate an uncertain sum for the support of a noble State institution. It would have been better to have set aside a fixed sum, even if smaller, and allowed the tax transfer fund to revert to the State.

The State Museum has only been brought to its present condition by much labor and no inconsiderable expense. As now arranged, it will compare favorably with those of other countries, according to the verdict of many persons who have visited similar institutions both at home and abroad; yet there are other specimens on hand, classified and arranged, in sufficient numbers to double those now on exhibition. They are packed in boxes in another room, and await the purchase of cases for their display. The specimens already in the museum are crowded for want of case room. They should occupy from six to ten cases more, to show them to the best advantage. This could be easily and quickly done if the money was forthcoming to pay for the extra cases. The boxed specimens could also be displayed within a month if the necessary funds were provided.

While the institution has been called the "Mining Bureau," and so far has been paid for by the miners, its usefulness has been general, and the merchant, manufacturer and the agriculturist are, or should be, deeply interested in its success.

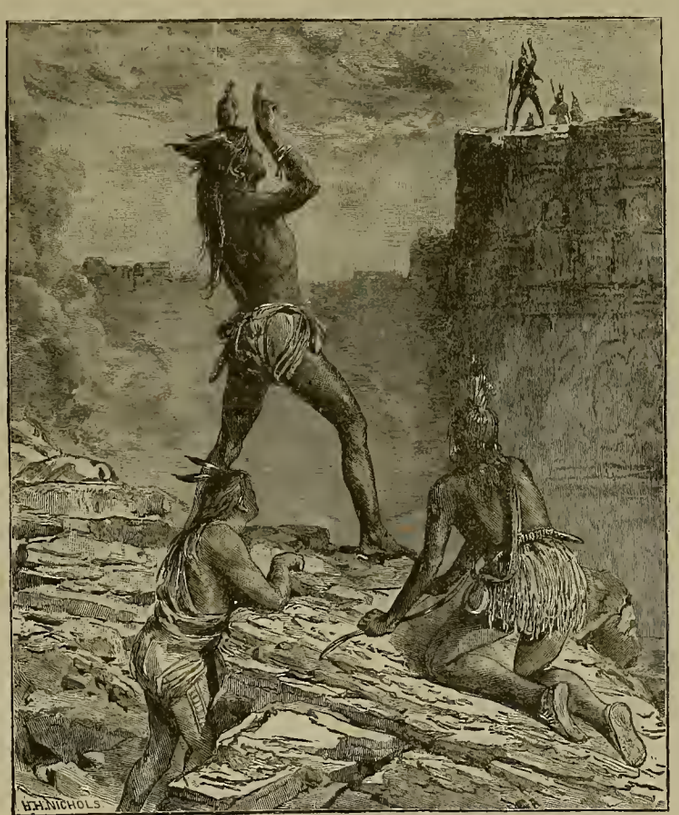
In order to manufacture to advantage, crude material must be both abundant and cheap, and, as far as possible, should be found within the State borders. It is now known that gold and silver are not the only metals in the State worthy of attention, but that other ores having an economic value are abundant. Many such instances have been made known through the agency of the State Mining Bureau. It ought not to be true that we waste enough in California to make the entire population comparatively rich.

Mr. Hanks says the Mining Bureau has grown out of all proportion to the provision made for its support, and quite beyond the expectations of its friends; but the management now finds itself in the anomalous position of being compelled to retard its progress rather than to push it forward. It has long been evident that the State Museum was becoming too extensive and valuable to be managed by a single individual. The experience of the last three years has shown that there is a great future for the institution, if properly managed, and it is well worthy of the fostering care of the State. But it has already become so extended in its scope that no person is competent to manage it without the advice and assistance of others. Under this conviction, I asked, in my last report to the Governor, "that a Board of Trustees be appointed to share the responsibility and management of the State property, leaving the State Mineralogist free to travel, to investigate and report upon new discoveries, and to conduct the scientific departments with his assistants." This was recommended by the Governor in his message, and, although no action was taken, I am still as strongly impressed with its importance as before.

It is clear to my mind that the time has come when the State Mining Bureau should be reorganized and placed on a permanent basis, or the museum closed, and the institution and office of State Mineralogist abolished. In view of these considerations, and not wishing to bear the whole responsibility, I called a meeting of prominent citizens, asking them to act with me as an advisory committee, and to whom I set forth the above stated facts. Mr. Hanks then describes the means adopted to bring about the Mining Exposition carried out during the conclave. He refers feelingly to the death of Hon. Joseph Wasson, the founder of the Bureau. The concluding paragraph of the first part of this report is as follows:

"It is the province of the State Mining Bureau to seek locations of all minerals having an economic value, to learn their quality and extent, and to place specimens in the museum for study and reference. To afford an opportunity to do this to the best advantage, the State Museum should be separated from the office of State Mineralogist, and be placed in charge of a Board of Directors or Trustees. The State Mineralogist should be ready and free to start at a few hours notice to any part of the State, to investigate any new or interesting discovery, and should make himself familiar with the condition of mines and mining. He should know by personal observation the localities of all the useful minerals in the State, and should spend most of his time in the field, collecting specimens and information; the first to enrich the museum, and the latter to be published in the annual reports."

We shall quote freely from Mr. Hank's very elaborate report on "Borax," in future issues of the PRESS.



INDIAN SYSTEM OF SIGNALING.

The Ophir Mine.

Quite a ripple of excitement has been caused this week over the contest for control of the Ophir mine. Senator Sharon and Mr. Flood both wanted to have the mine. At the election it was agreed that the stock voted should be in the name of Morrow for his party and in Flood's name for his party. The Flood party scored the first vote, and steadily piled up small blocks of stock until the stockholders' names commencing with C had been voted. Then the vote stood: Flood, 7,344⅞ shares; Morrow, 606. All the way through the Morrow party were seen to have been deceived into placing too much reliance on proxies. In three blocks out of five they would produce a proxy, but the Flood organization would squelch it by producing the stock itself and voting it, the rule being that stock took precedence of proxies. A proxy from Homer S. King & Co. for 2,655 shares was so served, and up to the close of the 2's the vote stood: Flood, 38,501½; Morrow, 2,350. Then the Morrow faction presented a solid block of 44,887½ shares, and the proxy of E. A. Richardson, which sent them to the front by a score of 48,580½ to 47,952½. The excitement was now intense, and continued so to the end of the voting, which left Flood a winner by a score of 51,570 to 49,021. The Flood men soon made up the Directors, as follows: C. L. Weller, R. H. Hollis, Cornelius O'Connor, C. H. Fish, A. K. P. Harmon, Maurice Schmitt and James H. Dobinson, the latter being the Morrow minority, and the preceding four the Flood men. It is estimated that the fight cost the participants in the neighborhood of $250,000. At Virginia City the result was celebrated by bonfires, and hailed by the miners as a victory for deep mining.

Indian Customs.

Since Major Powell took the chief position on the U. S. Geological Survey great attention has been paid to ethnology, and more particularly have the habits of the Indian tribes been studied. Major Powell himself spent several years in the Southwest studying the characteristics of the different tribes. His description of the customs of the Indians of Arizona and New Mexico, and those regions traversed by the great Colorado river, are specially interesting. Among other special features of which he has made a study is that of their sign language and system of signaling. They manage to convey to each other from long distances information of importance to them, such as the approach of an enemy, etc. We select from one of the sketches illustrating their system of "telegraphing," a scene showing two Indians signaling to each other. The sketch is quite a spirited one. We shall shortly quote a chapter on the subject of Indian signals, which will be of interest to many of our readers as showing the means adopted by the savages of spreading their news rapidly, without the mechanical appliances of civilization.

CORRESPONDENCE.

New Assay for Copper.

[Written for the MINING and SCIENTIFIC PRESS by C. H. AARON].

This new method has been in my mind for some time, but I have only lately had an opportunity of working it up.

Potassium zanthate, or zanthogenate, added to an ammoniacal solution of copper produces a voluminous, deep yellow solution, which curdles on agitation and settles very well when precipitation is complete.

These facts suggested the idea of a new volumetric assay for copper, more exact and in some respects less exacting than that of Mohr, by potassium cyanide.

Potassium zanthate is a more delicate reagent for the detection of copper than ammonia. It is equally delicate for nickel, and it seems capable of a variety of different applications in the laboratory. It is easily made, and so far as my experience with it has gone, it appears to be reasonably stable.

One advantage which this new method possesses over that by potassium cyanide, is that neither arsenic, antimony, zinc or nickel interfere. Antimony it is true is easily kept out of the solution, and in many cases is necessarily so; but even if present it does no harm. Arsenic is not so easily removed entirely. The separation of zinc (e. g. from brass), is also rather tedious, but in this method is quite needless.

To make the assay I first prepare a solution of potassium zanthate in water, of such strength that 50 c. c. or thereabout will completely precipitate 100 milligrams of copper. I then ascertain exactly how many c. c. of this are required to precipitate 100 m. gs. of copper by trial and make a note of the number.

I then dissolve one or more decigrams of the ore (according as it is rich or poor), in such a manner as to leave lead, silver, and antimony insoluble. Then, if present, I remove by filtration. To the filtrate I add ammonia in excess, and if a considerable precipitate is produced, filter again.

I have not yet ascertained exactly what metals must be removed, but one among them is probably cobalt. As, however, the copper precipitate is soluble in potassium cyanide, the separation may not be troublesome, even when cobalt is present, which is not so very often.

An easy way to remove cobalt along with iron, manganese, chromium, etc., is to boil the original solution before filtering with zinc, then filter and again dissolve the precipitated metals in the manner first indicated.

The ammoniacal solution obtained, the execution of the assay is not more tedious than that of the humid assay of silver bullion. I am using a Mohr burette, capacity 50 c.c., graduated to half c. c. So delicate is the reaction that the burette should be graduated to tenths. I propose to get Erdman's float, and graduate that, on the plan of the vernier. The only objection to using a greater quantity of copper or of ore in this assay is the large quantity of precipitate formed. If this is immaterial the solution may be titrated to one gramme of copper and a proportionate quantity of ore taken for the assay. In this case a decime solution may be used for the ending. It would also be well to have a solution of copper and a suitable pipette for verification by back test. In this way the assay may be made quite as accurate as the humid assay of silver (Gay Lussac's). For the present, however, I proceed as follows:

Charge the burette with the titrated zanthate and run it into the ammoniacal solution of copper in a conical precipitating glass, stirring *gently* with a glass rod. The blue solution soon appears green from admixture with the yellow precipitate. Gradually the yellow predominates and seems to become darker, but the green color is still visible. When the green has almost disappeared, stop the flow from the burette, stir quite gently for two or three minutes, and then allow of settling. One of the signs of approaching completion is that the solution clears with comparative facility. If the tolerably clear solution still has a distinct green tinge, run in about half or a whole c.c. of zanthate; stir and settle again, and when the green becomes doubtful proceed, quarter by quarter, adding zanthate, stirring and settling with more and more care, until the last added quarter c. c. of zantbate produces no cloud. Now stir and settle very clear; dip the end of a small glass rod into an ammoniacal solution of copper. Not a drop is required, but a film on the rod. Draw the wet end of the rod through the clear solution above the settled precipitate, holding the vessel in a good light, and if a light cloud is produced, enough of the zanthate has been used.

In adding the zanthate, toward the end, a record should be kept of each quarter c. c. and its effect. The last quarter which produced no effect, and was proved to be in excess by means of the rod wet with ammoniacal solution of copper, must not be counted. The quarter before the last must be counted as only an eighth, as a part of it was most likely in excess. Reading the burette with these deductions gives the number of c. c. of zanthate requisite to precipitate the copper in the assay. From this and the titre of the zanthate the quantity of copper in the assay is easily calculated, as in other volumetric assays. There are three indications of the approaching ending: First, the disappearance of the green color; second, the more perfect settling; third, the cessation of cloud production.

The solution may be made quite clear, but unless considerable time be allowed for the settling some flecks of the precipitate may remain suspended, and some will float on the surface. These do not interfere to any serious extent with the observations.

The reason for stirring gently instead of shaking vigorously, as in the silver assay with salt solution, is that violent agitation produces bubbles which cause floating of the precipitate.

The method is excellent for the assay of alloys of copper. I shall follow this subject up, and expect to find other uses for this valuable and little known reagent.

California a Good Mining Country.

The Mother Lode.

EDITORS PRESS:—After visiting nearly every mining district on the coast, from Alaska to Arizona, including the Territory of New Mexico, and further south into "old" Mexico, the conclusion is irresistibly forced on my mind that no one need go outside of California to mine for profit. Along the line of the great Mother lode, from Amador southward to Mariposa county, there are at different points large bodies of low-grade free-gold ores. It may take some years to educate the average mining man up to a realization of the value of this immense undeveloped wealth, but that it exists, and at the point indicated in this article, no intelligent miner who has investigated the subject can deny. The "old-timers" who came here in "'49 or spring of '50" have no conception of a large ore-body; their hobby is a small rich vein, with "more gold than quartz."

The Nevada miner is always on the look-out for "a second Comstock," a large ore body or bonanza, and wants it rich all the way through, such ones as were had in the Crown Point and Belcher, and afterwards in the Con. Virginia, California and Ophir. He turns up his nose at $5 or $6 rock, and laughs $3 rock to scorn, ignoring the fact that many companies in this section mine and mill at a cost not exceeding a dollar per ton. It may not be generally known that ore is now being mined and reduced at a profit at various points on the great Mother lode, which only pays $2.50 per ton. Of course the ore is easily obtained, and often as much as four tons to the stamp put through in twenty-four hours.

Were it not for fear of being considered as writing in the interest of some particular locality or of puffing somebody's mine, it would be easy to give proof and names abundant enough to satisfy any one. This class of mines are only now beginning to come to the front. Most all the large ore bodies spoken of lie east of the mother vein proper, sometimes running parallel with it on the hanging wall side, and then again being as far as five or six hundred feet to the eastward. These deposits will, in my poor opinion, and at no distant day, cause a revival of mining in this State to which the Black Hills and Leadville will not be a "marker." These ore deposits are composed, as a general thing, of talcose and pyriteous or mineral slates and schists, streaked and traversed in every imaginable direction, by spur veins or threads. These strata are often exceedingly rich, and the slate also carries a small amount of very bright, heavy flour gold, which is very easy to amalgamate. Some of these deposits are now being opened up. One mine of the kind in a neighboring county, after running thirty stamps some time, is now putting up an additional twenty, so it is presumable that the "stuff" (as the "old-timer" calls the ore) pays.

The large body of white quartz composing the main mother vein rarely pays. It is the stratified slate previously spoken of, and the east vein, a vein seldom as much as three feet wide running parallel with the mother lode, that carries the gold. Sometimes this "east vein" runs right alongside the great lode, only separated from it by a thin "gouge." All at once it darts off, and may run along until it gets a hundred and fifty feet or more away, perhaps sprangling out into minute threads and losing itself in the slate, or it may suddenly bend and come back again. It is not always continuous, and at best is a hard thing to trace on the surface, being "blind" as a general thing; wherever this vein is found it always pays, often going up into the hundreds in free gold.

At some places the mother lode pinches from ten or twenty feet down to a few inches. East of these pinches is a good place to look for large bodies of paying slate. Water power is generally obtainable, and by using the various improved forms of hurdy-gurdy wheels, quartz mills and hoisting machinery are run at trifling expense. It may be well to consider that most of these deposits can be quarried out; one deposit in particular known to the writer contains ore enough to run 200 stamps for twenty years without sinking a foot. The famed Black Hills mines, it will be remembered, contain considerably more slate than quartz. It is to the interest of the entire State that these large bodies of ore should be shown up. Raising wheat may be considered a safe business, but it requires more money at the present stage of the game, and is not nearly as certain of such large profits as mining the low-grade free-gold ores that lie to the east and north of the great mother vein of California. These deposits are as yet almost unknown to exist, even by people who live directly on top of them; by proper and intelligent search these deposits can be found and located, or if claimed can be bought very reasonably, as very little attention has been called to them, and there is no excitement.

CHAS. L. LANG.

Sonora, Tuolumne Co., Cal.

The Postal Telegraph.

A great multitude of bills has been brought before Congress during the few days it has been in session, but we doubt if any proposed measure is of greater or more general interest to the people of this country than the establishment of the postal telegraph, which is contemplated by several proposed enactments. We have frequently expressed our earnest approval of such an enlargement of the popular facilities for communication, and whether the matter be accomplished at this session of Congress or not, there is sure to be a general agitation of the subject, which will show the popular will and the establishment cannot be long delayed. Some argue that it is not in the power of the general government to conduct communication of this kind, but we see no reason whatever for the opinion. The postal telegraph is but the legitimate expansion of the present system of communication by mail, and certainly it is within the power and policy of the government as surely as were the various steps in the establishment of post roads and post routes, which have resulted in our splendid mail facilities. The only opposition we have seen to the measure thus far may be traced to two sources, one the interest which monopolizes telegraphic communication at present, which is of course to be expected; the other is the fear of increasing governmental patronage to such an extent that the army of office holders may be as powerful here as the army of soldiers is in some other countries. There is of course some reason to object to an increase of the amount of official patronage, but if civil service reform, which now shows some signs of gaining ground, be advanced, this danger will be lessened. And in counting up the objections to postal telegraphy one must also remember the great popular loss which results from present monopoly of telegraphic facilities.

In order that our readers may know in what forms the object is now presented to the attention of Congress we append several telegraphed abstracts of the bills proposed.

The first bill introduced was that of Senator Edmunds; and this distinguished statesman announces that he will make postal telegraphy one of his leading topics this winter. It is fortunate for the people that a gentleman of his wide experience in legislation and general ability has devoted himself to this measure. His idea is to have trunk lines connecting the capitals of the various States with the national capital as the main center, and then have lines in the States radiate from the State capitals to leading postoffices. He is opposed to the purchase of any existing lines and has had consultations with leading experts and collected a mass of figures bearing upon the actual cost of building the telegraph lines. He has also examined the latest system of putting wires under ground.

Another proposition is that of Senator Hill, of Colorado, and his bill is an elaborate scheme for the absorption of the present lines of telegraph by the United States government.

Still another project, and one which possesses especial local interest, is the bill introduced in the House by Congressman C. A. Sumner, of California.

Sumner's bill proceeds on the theory that a postal telegraph should be a part of the postoffice department, and provides for the appointment of a fourth Assistant Postmaster General, who shall be an electrician, and who shall take charge of the new service. The details of service are left to the Postmaster General. Bonds to the amount of $25,000,000, bearing three per cent. in denominations not exceeding $50, to run for thirty years but redeemable in twenty, are to be issued to construct the new lines of telegraph under the supervision of the Postmaster General. The bill provides that work shall commence at certain points in the country simultaneously. On the Pacific coast those points are Portland, Yreka, Sacramento, San Francisco, Los Angeles and San Diego, thus making a complete coast line. The whole system is to be opened fifty miles at a time, and any community desiring to connect with the lines first built may do so, and their lines, if built as required by the Postmaster General, may be accepted by him and paid for. Sumner's maximum rate on these lines is ten cents for the first ten words and five cents for each additional ten words. His maximum press rate, uniform all over the country, is twenty cents per one hundred words. In the transmission of letters, the use of stamps, the rights of correspondence, secresy, etc., the bill is similar to that of Senator Hill's. The low bond is designed to place the loan in the hands of the people of the country.

Representative Andersou of Kansas has revised his postal telegraph bill, introduced by him in the last session, and is soon to introduce it in the House. The following is an outline of the bill:

By its provisions the Postmaster-General is authorized to construct, maintain and operate three main lines of telegraph, the northern line to extend rom Ban gor, Me., to St. Paul; the central line from New York to Topeka, and the southern line from Baltimore to San Antonio. It is provided that all telegraph lines which since 1865 have been or shall be constructed by the Secretary of War, for the use of the army shall be, when no longer needed for military purposes, transferred to the Postmaster-General, to be used for postal telegraph, and be a part thereof; also, where the junction can possibly be made with the wires of any railroad or telegraph company which received a grant of public lands, or bonds or credit of the United States, the Postmaster General may use his discretion and cause the connection of postal telegraph therewith and all postal telegraph messages shall be transmitted over said wires at government rates and in a manner prescribed by law. The bill provides for the issuance by the Secretary of the Treasury of $6,000,000 of three per cent bonds, redeemable at option in ten years, to run not more than thirty years, which are to be offered for sale in open market at New York, the proceeds of sale to be applied to the construction and equipment of the postal telegraph by the Postmaster-General, who shall hold a sufficient reserve of said bonds as a surplus over the cost of construction as may be necessary to meet the interest for five years.

Thus the matter is fairly launched upon the attention of Congress and the people. We shall watch the measure with much interest and give from time to time information of its progress. It is an enterprise which should succeed forthwith.

The English Oak as a Timber Tree for California.

Distribution of its Seed by the University.

For some years past the English, German or European oak (*Quercus Robur*, var. *Pedunculata*) has been under culture on the experimental grounds of the University alongside of a large number of Eastern and other foreign oaks. Of all these, the "English" oak has shown so much the most rapid and thrifty development in this climate as to render its experimental culture in the various climatic regions of the State a matter of considerable interest, since in its native country this oak subserves most of the uses of the Eastern white oak, sharing with the ash most of the general uses of hard woods, the ash serving in lieu of the American hickories where elasticity and toughness is needed.

The rapid growth made by the European oak in the grounds at Berkeley has been noticed in the report of the College of Agriculture for 1880, page 68. During the first two seasons the growth made by this oak exceeded from two to three times that made by any other, besides throwing out many more branches, the seedlings attaining the hight of two or three feet; while the tap root was found to reach a depth of over three feet the first season. The latter circumstance explains its remarkable ability to resist drought when once established, which has also been reported from Australia. But at the same time it suggests the propriety of avoiding the transplanting of the tree from a nursery after the first year. The acorn should, if possible, be sown where the tree is to stay.

With a view to a thorough test of the adaptation of this important hard wood tree to California, a considerable supply of its fresh acorns have been lately imported. The greater portion of these have been sown in nursery beds, with a view to a general distribution of year old seedlings in 1884–5. A portion has, however, been reserved for distribution to persons desirous of testing the promise of this oak as a forest tree for California, and will be sent out in packages of a dozen acorns each on application. The acorns should be sown as soon as possible, covered with about an inch of earth. The tree thrives best on mellow soils, but has also done well on black adobe when kept mellow during the first season. In any case the soil should be one in which the tree can freely extend its tap root, upon which its resistence to drought depends; and to insure germination it is well to mulch the surface. Address applications to Prof. E. W. HILGARD, Berkeley, Cal.

University of Cal., Dec. 10th.

BIG MINING SALE.—J. W. Mackay and J. C. Flood, of the "bonanza" firm of San Francisco, have purchased for $450,000 the Quijotoa mines, which are located some 80 miles southwest of Tucson, Arizona, and were discovered last May. The purchase was made on the report of J. B. Low, W. S. Patten and Hank Smith. They report that nothing ever discovered on the Pacific Coast is equal to it outside of the Comstock. The purchasers will commence operations at once on an extensive scale, putting up the most approved machinery for developing and working ore.

SHIPPING POWDER ON THE UNION PACIFIC ROAD.—Heretofore nearly all the shipments of explosives have been made to Utah from California via the Central Pacific and Utah Central. The northern country has been compelled to haul all its high explosives used for mining purposes, from Ogden by team, the Union Pacific having refused to carry the article. Under an order recently issued at Omaha, the Union Pacific will hereafter transport, under certain established conditions, all kinds of blasting powders and explosives of which nitro-glycerine forms the basis.

MR. LOVINA, who has discovered a means of making low grade ores pay, by means of the leaching process, has gone to California to procure machinery for the purpose. The machinery will be placed in the Old Telegraph Smelting and Leaching Works, situated on the Bingham branch of the D. & R. G., which have been idle and going to waste for a long while past. The works will probably be in operation before Spring.—*Salt Lake Tribune.*

MECHANICAL PROGRESS.

Mechanical Exactness.

The practice of roughing out and then dressing by grinding, scraping, and paring to exactness must give way to that of accurate measurement and accurate tools to work to other measurements. It is evidently of little value to produce by expensive processes accurate gauges for screws, interiors, exteriors (for diameters), and scales for linear measurements, if there are not sufficiently accurate tools to work up to these gauges. Hand skill, unaided by mechanical exactness in machine tools, is not always sufficient to begin a job *ab novo* with exactness, or to carry it to completion without variation from the standard. In many instances an error multiplies itself and makes an insignificant divergence a serious fault. This may be particularly the case when the leading screw of a screw cutting lathe is faulty, and a longer screw than that of the lathe is to be cut by sections. If there is an error in the working portion of the leading screw it will reproduce itself, sometimes with aggravated quantity, until the end of the produced screw is reached, ruiniug the screw for exact work.

There has been recently started, in Hartford, Conn., a new company formed for the purpose of producing exact leading screws for lathes, racks, and pinions for longitudinal and lateral movements, and the closest gauged rules, or bars, for measurements to be applied to fine mechanical work, with or without aid of the microscope.

These results are obtained by simple mechanical contrivances, which are patented. So close is the guided action of the device that a leading screw of a screw-cutting lathe thirty-six inches long was detected as lacking in one-twentieth of an inch in the three feet of thread, and quite important variations were noticed in that length. In fact, the leading screw of a screw-cutting lathe made by one of the well known manufacturers of machine tools was so faulty in a distance of six feet that differently threaded screws could be cut by it at different portions of its length. More than this, it was discovered that a variation of one fifteen-thousandth of an inch was discovered—and rectified—which extended through only four inches in length of the screw. The result of the tests proved that in six feet of a leading screw there were three grades, only one of which was the pitch desired.

These variations in the leading screws of lathes are not uncommon, in fact there are many worse ones. No amount of judicious grinding will rectify an initial wrong in the cutting of the thread; it may reduce its irregularities, but it is impossible to move a thread bodily on its core, and whatever is ground off on one side leaves so much opportunity of backlash on the other.

It is evident that any device that can produce absolutely true threads running over inches and feet is an advance in the direction of exactness in machines, and consequently in the perfection of their productions.—*Scientific American.*

Testing Railroad Iron and Steel.

For nearly four years, says an exchange, the German railroads and iron and steel makers have been quarreliug about the specifications on the delivery of iron and steel for railroad purposes, the former carrying the requirements, determined by mechauical tests, very high, against which the latter have vigorously protested. Both parties have attempted to hold their position, not only hy elaborate reasouing, but by carefully conducted experiments. The facts which have been accummulated during the test are very valuable, and have thrown much light upon the relation between the actual duty in service and the quality as revealed by mechanical tests. The railroads insist that great tensile strength is proof of good quality, and they have attempted to gather facts to show there exists a relatiou between the figures obtained by test and the record of the material in service. Herr H. Brauns, or Dortmund, stated at a recent meeting of the German Association of Iron and Steel Makers that a careful examination of all the facts gathered by him bearing on this question had failed to bring out any such relation. He concedes that, for resistance against dead weight, against steady stress, the tensile strength of iron and steel furnished a good guide for estimating quality; but the duty which rails, tires, and axles are called upon to meet in actual service, are different in character. The German railroads demand high tensile strength and durability, judging the latter from the contraction of area. In order to show that their position is at least open to serious doubt, Herr Brauns has made an interesting series of tests, which are positive enough to satisfy his co-workers, but the railway authorities have, so far, refused to be satisfied with any such experiments. The question is one of much interest.

A SCALE OF HARDNESS FOR METALS.—Gollner describes a scale of hardness for metals in use in the laboratory of the Technical High School at Prague, composed of the following eighteen hard metallic substances, arranged in ascending order from the softest to the hardest. 1. Pure soft lead. 2. Pure tin. 3. Pure hard lead. 4. Pure annealed copper. 5. Cast fine copper. 6. Soft bearing metal (copper, 85; tin, 10; zinc, 5). 7. Cast iron (annealed). 8. Fibrous wrought iron. 9. Fine grained light gray cast iron. 10. Strengthened cast iron (melted with 10 per cent. of wrought turnings). 11. Soft ingot iron, with 0.15 per cent. carbon (will not harden). 12. Steel, with 0.45 per cent carbon (not hardened). 13. Steel, with 0.96 per cent. carbon (not hardened). 14. Crucible cast steel, hardened and tempered, blue. 15. Crucible steel, hardened and tempered violet to orange yellow. 16. Crucible steel, hardened and tempered straw yellow. 17. Hard bearing metal, copper, 83; zinc, 17. 18. Crucible steel, glass hard. The test is made by drawing a cylindrical piece with a conical point along a polished surface of the metal to be tested. In the case described, that of a bronze used for the cross head guide of a locomotive, the point, when loaded with 5 kilograms, was drawn six times through a distance of 3 centimeters. Under these conditions the points of the number below 5 in the scale were blunted without marking the surface; with Nos. 5 and 6 neither point nor surface were abraded; but No. 7, while being slightly worn on the point, began to scratch the surface. The hardness was therefore that of pure copper or soft bronze. The absolute tensile resistance was found to be 2,051.7 kilograms per square centimeter, while that of copper is 1,920 kilograms per square centimeter, and that of the bronze, No. 6 is 2,300 per square centimeter, thus showing an intimate relation between the strength and hardness of similar compounds.

BEARINGS AND FRICTION.—A bright and well known mechanic insists that on his swiftest moving journals he obtains the best results with cast iron on east iron, and he is willing also to depend on an emery-ground fit. Another, perhaps, equally authoritative, says that for exceptionally high speeds, as 4,000 revolutions per minute, cast iron on cast iron are inadmissible, but he employs untempered steel and hard Babbitt metal well hammered into the box and then bored out. He tried hardened steel boxes and soft steel spindle for that speed, and found that the boxes cut so rapidly as soon to destroy the spindle as well as the boxes. For heavy weights and large journals there appears to be nothing that gives better satisfaction than good Babbitt boxes hammered solidly. Cast iron boxes with wrought iron or steel spindles have done well where the weight and speed are not excessive. All soft metal hearings, as Babbitt or composition, ought to be protected, from the grinding influence, of dust, but east iron, if kept well oiled, soon forms a glaze that is almost indestructible. In all cases the journal should give speed enough for a film of oil, especially for high speeds under which it may become heated and slightly expanded. Many journals and boxes are injured hy binding, the consequence of a too finical fit.—*Scientific American.*

MANAGING STEAM BOILERS.—Getting up steam on a boiler or a battery of boilers, says the *Locomotive*, is thought to be a matter of no special importance in most manufacturing establishments, and when it has to be done in the night is commonly intrusted to the watchman, whose knowledge is limited to building a fire and keeping it going until an engineer gets there in the morning. This is a great mistake that has already cost many lives and thousands of dollars expenditure in repairing damages to property caused by their inexperience or recklessness. How many boilers have been injured hy watchmen under such circumstances only those familiar with such matters can tell. The *Wood-Worker* says: It is remarkable, but nevertheless true, that statistics show that over one-fourth of the boiler explosions in this country occur in saw-mills, planing mills, and other wood-working industries. Does this large percentage arise from over-work of the boilers, or the incompetency of the men in charge of them? It doubtless arises from the fact that boilers in such places are fired with shavings, or edgings and slabs, which produce a very intermittent fire, at one time exceedingly hot and at another much lower in temperature. Boilers so fired require careful watching.

LACK OF TECHNICAL EDUCATION AMONG AMERICAN MACHINISTS.—The Philadelphia *Ledger* says that a person who recently advertised for machinists tested the proficiency of all who applied, and remarked, when summing up the qualifications of the men, that though the Americans pleased him the most by their brightness, the foreign workmen were without exception better educated. The Americans had picked up their trades in the shops, but most of the foreigners, in addition to their shop practice, had attended technical schools. The latter could not only do good work with the tools, but they could lay out, make sketches, and, if necessary, draw the designs to scale. The American shop-taught workmen, though quick to understand, inventive, skilled in the use of tools, were markedly deficient in drawing and such knowledge of mechanics as is required hy the designer and draftsmen.

TEMPERING TOOLS.—A tool, after it is has been forged, should be so hardened or tempered that it will never want to come to the fire again until it is so worn down that it requires reforging. This saves the time lost in a second hardening; and it avoids the damage always done to the cutting power by rehardening without forging.

SCIENTIFIC PROGRESS.

The Latest Concerning the Glacial Period in America.

In the columns of the *Independent* for March 4, 1880, and March 10, 1881, a somewhat detailed account was given of the investigations of the Rev. G. Frederick Wright, of Andover (now professor in Oberlin), relating to the chronology of the glacial period. Since that time Mr. Wright has been busy collecting further information bearing upon the subject. In connection with Professor Lewis, of Philadelphia, he has accurately traced for the Pennsylvania Geological Survey the southern boundary of the glaciated region across the State, and during the year past, under the auspices of the Cleveland Historical Society, has followed it across Ohio and Kentucky to the Indiana line.

The southern boundary of the glaciated area of America crosses the Delaware river at Belvidere, a few miles above the mouth of the Lehigh river; thence its course is through Northampton, Monroe, Luzerne, Sullivan, Lycoming, Tioga and Potter counties, in Pennsylvania. It just touches the southwest corner of Alleghany county, N. Y., and reaches its northern limit in Cattaraugus county, a few miles north of Salamanca. Thence it turns southwest, running through Warren, Venango, Butler, Lawrence and Beaver counties, Pa., entering Ohio, in Columbiana county, a few miles north of the Ohio river. Thence its course leads through Stark and Holmes to Knox county, where it takes a sudden turn to the south through Licking, Perry, Fairfield, Rose, Highland, Adams, Brown and Clermont counties, crossing the Ohio river on the line between Campbell and Pendleton counties, Ky., and recrossing it near the southern boundary of Dearborn county, Ind.

Down to this line the whole country is covered with unmistakable signs of glacial action. Granite bowlders from the far north are numerous, both on the hilltops and in the valleys; stones of various kinds are mingled together in the unstratified clay deposits, and are striated as in the ground moraine of Switzerland. South of this line these signs disappear. In the river valleys water has often transported bowlders much further, but the action of water soon erases the peculiar marks of glaciation and leaves only stratified deposits.

This boundary line is remarkable, both for its indifference to latitude and elevation above the sea. In Monroe county, Pa., it rises 2,000 feet above the sea without being much deflected from its general course. In like manner it descends 1,500 feet to cross the Susquehanna at Beach Haven, and ascends to 2,000 feet again in Lycoming county, and continues nearly to that elevation until it approaches Ohio. Its sudden turn to the southwest in New York, and to the south in Knox county, Ohio, is not due to any change in elevation. The highest land in Ohio (about 1,900 feet) is in Logan county, north of the point where the ice is extended farthest south. The gradual descent into the valley of the Mississippi may have had something to do with the extreme southern extension, but the sharpness of the flexures in Cattaraugus county, N. Y., and Knox county, Ohio, show that the southern boundary was determined largely by the irregularity of the force pushing from behind. If, for example, snows had fallen in excess over the region of the upper lakes so that the ice was a thousand feet deeper than to the east, the effect would be to push a lobe of ice in the line of the least resistance to the southward of the ordinary boundary.

South of New England, through Cape Cod, the Elizabeth Islands, Long Island, Staten Island and across New Jersey, the southern boundary of the glaciated regions is marked by very large accumulations of glacial material, forming hills from 50 to 200 feet in hight along the whole line. West of this the terminal accumulation is not always so marked, but the boundary is everywhere sharply defined, and through a good portion of the distance the excessive marginal accumulation continues. Noteworthy points at which to observe this feature are in Pennsylvania, on Pocono Mt., Monroe county; in the valley of the Susquehanna, at Beach Haven; of Conowango creek, twelve miles north of Warren, and near French creek, a few miles west of Franklin; also in New York, south of Randolph, and in Ohio, near Canton, Stark county; Thoruville, Perry county, and Adelphia, Ross county.

The distance to which bowlders found in Ohio and Kentucky have been transported is noteworthy. Ohio is covered throughout the larger part of its territory by the nearly horizontal strata of carboniferous and devonian formations. Not only are there no native granite rocks within its borders, but none are to be found in place to the north short of the shores of Lake Huron. Yet a granite bowlder 18x12x6 feet in dimensions occurs near Lancaster, in Fairfield county, Ohio, which must have come from Northern Canada, 400 miles away, and conglomerate bowlders containing pebbles of red jasper characteristic of the hills about Lake Superior are found in Boone county, Ky. That the ice sheet of the glacial period crossed the Ohio and entered Kentucky a few miles can no longer be questioned. * * *

The effects of this extension of the ice sheets into Kentucky are very interesting. The Ohio river occupies a narrow valley about one mile wide and from 300 to 500 feet deep, cut previous to the glacial period through the horizontal strata of the coal measures. Hence the passage of the glacial ice across the channel of the river must have formed a dam from 500 to 600 feet high. This must have raised the water in the upper portion of the channel high enough to have submerged Pittsburg 250 or 300 feet deep and formed a large lake covering the junction of the Alleghany and Monongahala rivers with the Ohio. Very likely this may be the key to unlock the mystery of the extraordinary river terraces both above and below Pittsburg. We shall soon know the exact boundary of the glaciated area, and be able to study at a great number of points the streams which break through this boundary.

Differences in Tidal Action.

It will afford some notion of the various conditions which must be taken into account before anything like a complete knowledge of tidal action can be obtained, if we remember that in the open ocean the rise or fall nowhere exceeds a foot or two; while at Mount Saint Michael the rise is eighty or ninety feet; in the Bay of Fundy, particularly at Annapolis, it sometimes amounts to a hundred feet, and about the Morea there is no change at all. On our own coasts the rise varies from thirty to forty feet, at some parts of the west of England, to be nil at a point in the German ocean north of the Straits of Dover, where a flow transmitted through the straits encounters an ebb transmitted round the north of Scotland, so that an equilibrium is maintained. The actual movement due to attraction, moreover, whatever it may be, requires time for its full development, and still more time for its propagation, the latter requirements being greatest where movement is impeded by sheer friction, and thus reaching its maximum where the friction is due to the beds and winding channels of rivers, along which, consequently, the tidal elevation passes as a wave, succeeded by a flow. If it be high water at the mouth of the Thames at noon, the full flow will not reach London Bridge until midnight, by which time it will again be high at the Nore. In the meanwhile, there has been low water at the Nore and high water about half way to London; and while the high water is proceeding to London it is ebbing at this intermediate place, and is low water there when it is high water at London and at the Nore, where the river is of such magnitude as to afford a sufficient distance for the full development of the phenomena successive tides produce successively but co-existing elevations, separated by corresponding depressions; and in the River Amazon, between Para, at the mouth of the river, and the confluence of the Madeira, there are no less than seven co-existent high waters, with as many low waters between them. The same kind of thing occurs in all arms of the sea, or in all gulfs or bays which are open to the main ocean on a single aspect; the successive tides sweeping along their shores to reach different places in succession, and this at a rate of speed which is greatly determined by the sinuosities and other characters of the coast line.—*London Times.*

Constitution of Comets.

No less than seven comets have been observed during the past year, one of which was photographed by Jassen in France, Common in England, and Draper in New York. Huggins states that carbon, hydrogen, and nitrogen are undoubtedly found in the substance of comets, and oxygen also is probably present. The chemical composition of twenty comets which have been studied appears to be essentially the same. There are often certain secondary modifications, which show that the predominant conditions are not rigorously uniform, and that they may vary from day to day in each comet. The temperature, the density, the amount of gaseous matter emitted by the nucleus, undergo continual variations. It is probable that the spectrum of hydrocarbon is complicated by traces of the spectra of compounds of oxygen and carbon. Meteorites are probably of the same nature as comets, and gases can be extracted from them in such quantities as to be exhibited before an audience. In 1867 Prof. Odling, when lecturing upon the researches of Graham, lighted the lecture room with gas that a meteorite had brought from the realms of space. The meteorite was chiefly iron, and contained nearly three times its volume of gas, of which 85 per cent. was hydrogen, 5 per cent. carbonic oxide, and 10 per cent. nitrogen. Prof. A. W. Wright found in a stony meteorite gases which occupied a volume two and a half times as great as that of the meteorite, or twenty times as great as that of the iron which was dispersed in its mass. The gases were the same, but in different proportions. The idea that the light of comets and the phenomena of their tails are produced by electricity appears to be spreading. Zollner, especially, has endeavored to show that the known laws of electricity are altogether sufficient to explain cometary phenomena. It has been commonly supposed that the bright lines in cometary spectra indicate heated luminous gases. Prof. Wright and Johnstone Stoney think that the decomposed vapor is opaque, as compared with the special rays that appear like bright lines, and that the brightness is due to the reflection of the sun's rays from the vapor. Stoney regards the phenomena as one of phosphorescence.—*Annals of Chemistry and Physics.*

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

PLYMOUTH CON.—*Ledger*, Dec. 15: One hundred stamps of the Plymouth Con. Co. are in operation at this writing. The mines are turning out the usual quota of gold, paying a dividend every month. The pipe to conduct water from the receiving reservoir to the works is arriving by wagon loads every day. It is made of No. 14 iron, and is 20 inches in diameter. The reservoir will be finished this week. The joints of pipe instead of being lapped over, will be joined together by iron bands, and the crevices filled with lead to prevent leakage.

SUTTER CREEK.—The outlook for Sutter creek has materially improved during the past few days, owing to the prospect of at least two idle mines being started up almost immediately. It is reported that the old Wildman mine, that has been dormant for many years, will be operated right away by San Francisco capitalists. James Morgan, in company with two capitalists from the bay, inspected the property early in the week. The mine shows good rock, but the water could not be controlled by the light machinery that was put up in early days, and this in a great measure was the cause of its being abandoned. I am pleased to state also that the Lincoln is likely to start soon. S. D. R. Stewart has secured a lease of the property for three years, and will proceed to work it at once.

At the Amador Con., 20 stamps are kept running steadily, and the working force has been somewhat increased. There have been no new developments worth noticing.

BUNKER HILL.—The Bunker Hill Co. has purchased two large boilers from the Oneida M. Co. They were hauled from the Oneida to the Bunker Hill mill last Tuesday. They are for the purpose of fixing up the mill to run by steam, so that there need be no suspension whenever the supply of water fails. The mill has been idle for weeks past in consequence of shortage of water. The ore now being worked at the Keystone is of a higher grade than for some time past.

Calaveras.

WEST POINT.—Cor. *Chronicle*, Dec. 15: Mr. Richardson has his quartz mill completed and is now crushing ore. The Scorpion mine is running; the owners have erected a new boarding house. The Wide West is still running, and taking out good ore. Mr. Geo. Eberhart has struck a rich mine and is taking out splendid rock. The old Wood House mine is running, and the owners are taking out good ore.

NOTES.—The *Citizen* of the 15th gives these items from the *Prospect* of the 8th: Ben Hughes has commenced work on what was formerly known as the Lemon claim on Tunnel ridge. This claim is said to have received its name from the fact that chispas, of about the size and shape of lemons, were at one time plentiful. The company working the Gold Cliff mine, in the vicinity of Angels, will soon commence grading for a new mill. It is thought that a 40-stamp mill will be erected. The mine known as the Bovee mine, near Angels, has shut down temporarily for repairs. The Old Reserve mine at Carson hill is reported in full blast. The 40 stamps are kept in constant action day and night. H. Howarth and Thos. Ryan are getting rich gravel from their mine at Chili junction.

MURPHY'S.—Mountain *Echo*, Dec. 12: In the Red Wing, more men have been set to work in the levels, and the production of ore will be considerably increased. The company has 37 men. The mine, mill and chlorine works are working smoothly. The one stamper still keeps up its monotonous thump on ore from the O. K. Buckhorn and other mines in the vicinity. Concentrates are being hauled from the Calaveras mine for reduction in the Oro Plata chlorine works. They are from the old tailings. The Calaveras mine is the most economically worked mine in this vicinity, and with the Burleigh drill now in operation developments are progressing finely. Experts who have been among us lately, have bonded several mines in this vicinity. There is a rumor of the starting up of the Fair Play mine and mill again.

El Dorado.

INDEPENDENCE.—*Republican*, Dec. 13: The old Independence mine, near Brownsville, that produced near $100,000 in early days and was only worked about 50 ft deep, has been bonded to some Eastern parties, and work has been commenced to open it.

The recent clean-up at the Melton mine at Grizzly flat was the largest that has been made.

SPANISH DRY DIGGINGS.—*Republican*, Dec. 15: On Monday we had a chat with W. A. Bucknam of Spanish Dry Diggings. He has great confidence that at a not far distant day some permanent and rich mines are to be opened up on the Divide. He has a contract for running the new tunnel which is to relieve the Morrell Con.

RIP VAN WINKLE.—Georgetown, Dec. 14: The Rip Van Winkle quartz mine, better known as the Jordan & Zombro mine at Slate mountain, southeast of Georgetown, has been bonded to Mr. Monkton of San Francisco for six months for $16,000. Mr. Monkton has already laid in his winter supplies, and put two shifts of men at work drifting on the lode. Messrs. Jordan & Zombro, in addition to putting down an 80 ft shaft and tapping the lode with a large tunnel below that depth, have drifted some 40 ft on the ledge, all in ore which will average $20 per ton. The ledge is some 3 ft in width.

NASHVILLE.—Cor. Amador *Ledger*, Dec. 15: At the Havilah mine, Nashville, El Dorado county, a fine body of pay ore was struck in the tunnel of the 500 level. It promises to be the boss mine of El Dorado county. At another mine, a mile or so north of Nashville, nearly $10,000 in specimens was taken out last week. Mining in that locality is having a boom.

The hoisting works building over the south shaft of the Nashville mine were destroyed by fire Friday. The building was used as a blacksmith shop and changing room. The origin of the fire was a red-hot stove pipe. Being a cold day, the miners filled up the stove with chips. Eight men were discharged on account of the accident.

Inyo.

SLATE RANGE.—*Independent*, Dec. 15: The fine new mill of the Argus M. & M. started up on its initial run last week. It met with the usual and vexatious break-down, of course—the bursting of the pumps supplying the boiler. However, the result of only 36 hours' operations with only one battery of 5 stamps was a bar of fine silver worth $2,800.

MONTEZUMA FURNACE.—On Sunday morning the new furnace of the Owens Valley M. & S. Co., at Elna, was fired up, charged and the blast turned on. Up to Monday night the results were favorable as could be desired, the yield being some 70 bars of silver lead bullion. At last the lead well blew out, shutting down operations. The delay involved may extend over two weeks or more.

THE MODOCK.—Rumors come of an important new strike in the old Modock mine, Lookout district. Supt. Fitzgerald has a strong force at work preparing for a big run of the furnaces.

ARRIVED.—A car-load of machinery for the new Maxim mill at Chrysopolis has at last arrived.

Mariposa.

MARIPOSA IMPROVEMENT COMPANY.—Cor. *Herald*, Dec. 14: In the vicinity of Hornitos, where Mr. Hulings is operating, there are many mines that will pay from $5 to $10 per ton. These mines can never be made to pay by working on a small scale, but can be made splendid investments worked as Mr. Huling's purposes, i. e. by a large mill run by water power, said mill being placed on the banks of the Merced river where there is an unlimited supply of water the year round to run at least 500 stamps, the ore from these different mines being conveyed to the mill by cars on a narrow gange railroad.

Mr. Hulings has formed the "Mariposa Improvement Co.," and his No. 9 30-stamp mill is paying handsomely on $15 rock from the Mt. Gaines mine, one of the numerous mines which this company owns; and I am satisfied that the company will be surprised at the number of $15 mines which will be developed as they progress with their work.

Mono.

JORDAN.—Bodie *Free Press*, Dec. 15: It was reported yesterday that a rich development had been made in the Levenfeldt tunnel in Jordan district, half a mile or so this side of the mouth of Mill Creek canyon. It is certain that specimens of good ore were exhibited as having been taken from the tunnel. The ore looks like Comstock stuff, and if there is enough of it the owners have a good thing.

A REAL PROSPECT.—Same of 16: The strike mentioned yesterday as having been made in the Levenfeldt tunnel was no "steamboat." A large body of ore has been uncovered, the lowest assay of which is $193 per ton. D. E. Jones and S. O. Johnson are the owners. The former owns 300 ft and the latter 1,200. The tunnel is in 427 ft, cutting the vein at a depth of 320 ft. So far as developments show, the ledge is 27 ft wide, and most of the vein matter is good ore.

MAMMOTH.—Same of 13: A reporter was informed yesterday that the men who hold a lease of the old Mammoth mine had made a rich strike, something like the pocket that gave the mine its original reputation. It is said that the new find is in the old workings, and was passed over by the late management. There are many who believe that there is good in Mammoth yet.

OLD MONO.—The *Free Press* learns that a company of San Francisco men intend to take hold of the Keith mine in Old Mono—or it may be in Keith district. Peter Tautphaus spent some money on it, and sunk a shaft about 80 ft deep, some years ago, on a vein about a foot wide. The ore was very good, some of it being worth upward of $100 per ton.

STANDARD CON.—Same of 11: Extracted and shipped to the mill 1,296 tons of ore; received 2,130 ounces of crude bullion, and shipped $10,997.60. Upraise No. 1 from south drift No. 2, 1000 level, is up 156 ft; progress 8 ft, showing 5 ft of vein, which is looking well.

BODIE CON.—During the week ending on the 8th instant there were 145 tons of ore hauled to the mill and the same amount crushed. The average assay value of the pulp was $24.45 per ton; that of the tailings was $4.90 per ton.

BULWER CON.—The North drift, 700 level, has been advanced during the week 13 ft; total length 482 ft. The ground is hard. West crosscut from south drift, 500 level, is in 470 ft, in very hard ground.

BODIE TUNNEL.—The south drift, on the 300 level, has progressed 12 ft. The north drift, on the same level, has progressed 6 ft during the past week. The mine never looked better than at the present time.

Nevada.

EMPIRE MILL.—Grass Valley *Union*, Dec. 12: The reconstructed mill of the Empire Co. works well. The concentrators used are the "Triumph" patent, a comparatively recent invention, and claimed to be superior to the "Frue," which has stood in favor as the best machine of the kind in use. These six machines take and dispose of all the tailings of the 20 stamps, whereas for the same number of stamps eight of the Frue machines would be required.

IRON MINE AT HOTALING.—Grass Valley *Union*, Dec. 15: The Iron Furnace at Hotaling has shut down on account of a scarcity of charcoal. The consumption of charcoal is about 3,000 bushels per day, which makes it necessary for a very big stock to be accumulated to keep operations going on regularly.

AJAX.—A pumping and hoisting rig, to be run by water, has been put up on the Ajax mine, in the bed of Wolf creek below the Allison Ranch mine. The old prospect shaft, which was filled up, has been cleaned out, and a small ledge of good looking quartz has been exposed.

LIVE OAK.—The Live Oak mine in the southwestern portion of the township, is bieng opened by A. W. Stoddart. The shaft is 170 ft in depth, and drifts have been run each way to distances of 62 and 26 ft. In the largest drift, stringers, that show well in gold and sulphurets, are making from the footwall into the main hanging wall ledge, and the ledge improves in appearance as the drift is extended.

WILLOW VALLEY.—Hussey and Hussey's quartz mine in Willow Valley, upon which hoisting works were recently erected, is being rapidly developed and the prospects are encouraging. The incline is down 140 ft on the ledge, and the bottom is in a three-foot body of heavy sulphureted ore that looks as though it would yield handsomely. Sinking will be continued to the depth of 240 ft before drifting is done.

YUBA TUNNEL.—*Tri-Weekly Herald*, Dec. 13: Yesterday the long tunnel which the Yuba tunnel Co. have for the past three years been engaged in driving through one of the hills on the South Yuba river, near Hoyt's old crossing, was completed. There is now an underground passage from one side of the hill to the other. It is the company's intention to turn the water of the Yuba through the tunnel and then work out the tailings down to the river bed. The river can be worked out for a long distance and it is believed will pay handsomely. In celebration of the completion of the tunnel, a fine dinner was served at the mine yesterday, at which several ladies and gentlemen of this city were present.

YOU BET.—The English Co., at You Bet, started their new hoisting works at the Uncle Sam mine last week. Drifting has been commenced. The company's cement mill will probably be running next week. The Haywards Co. are pumping out their mine preparatory to beginning operations for the winter. A force of men will be put on as soon as the mine is free from water, and the mill started up.

Placer.

THE COPPER MINE.—*Argus*, Dec. 13: The California Copper Mining Co. at Whisky diggings have let a contract for sinking the shaft 50 deeper, making a depth of 120 ft. The shaft is a two-compartment one, 4x8 ft. At the present time there is a vein of copper mundic occupying the full width of the shaft, which carries 8 per cent of black oxide of copper, which increases in quality as depth is attained. In driving a side drift stringers of black oxide of copper have been found that assay 40 per cent. The prospects of the mine are very encouraging.

IOWA HILL ITEMS.—A. Hazelroth of Grizzly flat has struck good pay. The Morning Star still continues to pay well. Most of the mines are ready for water. It is reported that H. Simons has sold his mine at Independence Hill to some Chinamen from Dutch Flat.

Plumas.

DUTCH HILL.—Greenville *Bulletin*, Dec. 12: During the past two years the Savercool brothers have been prospecting at Dutch Hill for quartz, and up to this time have found three ledges that give promise of being valuable. On Saturday the brothers were in town and took over a small prospecting mill with which they propose testing the ore from now until next spring. All three of the ledges are large, and such hand prospecting as has been done gives very fine results. Mr. Savercool said: "We intend to astonish the country next spring." From the many rich ledges that have lately been found in Plumas and Sierra counties the chances are that an era of prosperous mining is near.

Shasta.

IGO.—Cor. *Courier*, Dec. 15: W. O. Cooper has disposed of his interest in the mine and arastra to Wm. Robinson. They have just completed a run for Cal. Smith and commence to-morrow on a run of their own. E. L. Ballou's arastra is running on Manzanita ore. The mine is looking well, the several tunnels all showing good pay ore. Work is also being done on the Falls, and will be resumed soon on the Hope. Crume & Hubbard are getting out their usual grade of ore from the Pacific, and their arastra is running on the same. Wright & Ormsby keep their arastra going on fair grade ore. J. B. Strong is taking out more rich ore from his Atlantic, and will soon have out a run. Robinson & Co.'s arastra is running and the mine is looking better than ever.

MARION MINE.—Zent has 50 tons of $300 assay ore on the dump at the Marion mine, Whiskytown, and 50 tons more coming out.

LOST CONFIDENCE.—*Democrat*, Dec. 12: This morning 10 tons of ore from the Lost Confidence mine at Iron mountain was shipped in sacks to San Francisco to be worked. This ore is like sand, of a greenish color and is said to be worth from $125 to $150 a ton. A former shipment of the same kind of ore yielded $137 a ton.

Sierra.

BIG STRIKE.—*Tribune*, Dec. 13: The people o Sierra city have been greatly excited for the past few days over the discovery of a rich quartz ledge located near Deer lake, north of the Sierra Buttes peaks. The claim has been located by Messrs. Busch, Sunderhaus, Hughes and Deidesheimer. Very rich ore is exposed at points 400 ft apart on the ledge, where prospect holes were sunk. The vein varies from 3 to 7 ft in width. From authentic reports received at this office, concerning the new find, it can certainly be considered one of the most important ever made in the county. Soon after the find was made one of the owners offered a co-partner a handsome sum for his interest in the claim.

POKER FLAT.—L. D. Davis returned from Poker flat last Thursday, where he had been surveying the Sierra Phœnix quartz claim, owned by Lindsey and Southerland, of Howland flat. This ledge produces fine prospects from several points at which it has been opened during the past few years. The vein is an immense one, measuring 60 and 70 ft in width at some points. It is the intention of the present owners to sink a shaft on the ledge at once.

ROMAN.—Prominent among the promising quartz lodes in the Sierra City district is the Roman, 1 mile east of the well-known Keystone mine. The Roman ledge was first located a number of years ago by a party of Mexicans, who found the ore sufficiently rich to warrant its being packed on mules to the river, a distance of over one mile, and there work it in arastras. It is said that considerable bullion was realized from the ledge by that mode of working. It is owned by Sierra City, Downieville and San Francisco parties.

Siskiyou.

DEADWOOD.—Yreka *Union*, Dec. 13: Pyle & Co. have their arastra nearly completed and ready to run. They have a good house built over it, and expect to be able to run all winter. Schroder & Co. have their provisions laid in for the winter. Their ledge is situated on the east side of Deadwood creek, is 4 ft thick and prospects well. Tucker & Co. have shut down for the winter. All of the quartz mines on Indian creek are doing well. The Bonanza mine is yielding a large amount of rich rock and the mill is steadily grinding away.

Mr. Wm. McConnell arrived in town on Monday with 82½ ounces of gold, the result of three days work in his claim on the Klamath. This is a good clean-up for only three days running.

SISKIYOU TUNNEL.—From Mr. Jos. Dennison, who arrived from the Siskiyou tunnel on Sunday, we learn that work is progressing rapidly at both ends of the tunnel, 194 ft having been driven at the south end, and 190 ft at the north end during the last month. Only about 2,000 ft remains between the two benches to be driven, which it is expected will be completed in about five months.

NEVADA.

Washoe District.

COMBINATION SHAFT.—*Enterprise*, Dec. 15: The greater part of the new hydraulic pump is now down in the mine and set up. They are now waiting for a quantity of column to connect the 2400 and 2600 levels. This was shipped yesterday, and will be on the ground about next Monday.

YELLOW JACKET.—Owing to the sudden shrinkage of water in the Carson river consequent upon the freezing up of the mountain tributaries of that stream the mills have been obliged to hang up most of their stamps.

HALE AND NORCROSS.—The only work now being done is at sinking the winze below the 2700 level. The new hydraulic pump will be started up in a few days at the Challar-Norcross-Savage shaft.

SIERRA NEVADA.—The raise from the 2900 is being pushed up toward the 2700 level as rapidly as possible. The cutting out of an east station on the 3100 level is completed.

UNION CON.—The station to the east of the joint Sierra Nevada winze on the 3100 level was completed yesterday. The main south drift on the 3100 level is being advanced at the rate of 25 ft per week, and the main north drift at the rate of 35 to 40 ft per week.

GOULD AND CURRY.—The joint Best and Belcher winze is now about 115 ft below the 2500 level, and and is still in soft ground that is inclined to swell.

BEST AND BELCHER.—The joint Gould and Curry winze below the 2500 level is in soft vein material, with streaks of heavy black rock, that contains masses of iron pyrites. There is some water coming in at the bottom.

ALTA.—A second donkey pump was put in and the water was taken out at ten o'clock yesterday morning. The 2150 level is now drained, and they will soon resume active operations on that level.

CROWN POINT.—The Mexican mill, on the Carson river, can now only crush about 50 tons of ore per day, therefore it has been found necessary to temporarily reduce the force.

OPHIR.—A considerable amount of ore is still being found on the 150 level that will pay for extracting and milling.

IMPERIAL.—Good headway is being made in the main west drift going out to tap the old upper levels of the group of mines commanded by the Imperial shaft.

SCORPION.—The face of the west drift on the 500 level is in vein porphyry that shows frequent streaks of porphyry and seams of clay.

ANDES.—Some very fine looking quartz is being encountered in the north drift, and in the south drift is being found some ore of low grade.

CALIFORNIA.—Fair progress is being made in the sinking and timbering of the joint Con. Virginia winze below the 2700 level.

BELCHER.—Some ore is still being extracted, but the very low stage of water in the Carson river is again interfering with milling.

UTAH.—Good progress is making in the north drift on the 1750 level. It is going into ground hitherto wholly unexplored.

MEXICAN.—The principal work at present in this mine is the making of repairs to the drift and upraise on the 1600 level.

CON. VIRGINIA.—The usual progress is being made in the joint California winze on the 2700 level.

UNION SHAFT.—The easing of timbers and the making of needful repairs is still continued at the 2300 station.

OVERMAN.—Are taking out some ore from the ground in the upper levels.

Candelaria District.

MOUNT DIABLO.—*True Fissure*, Dec. 15: A north crosscut is now in 41 ft and shows 15 inches of $140 ore. Near the shaft above the first level, a south crosscut has been driving 90 ft, and shows 12 inches of $75 ore in the face. A bullion shipment was made on the 7th instant of $4,812.37, and another on the 10th of $6,525.17

COLUMBUS CON.—The drift from the bottom of the Bonanza winze, running to connect with the main shaft, has been extended about ten ft beyond the imaginary foot wall of the ledge, crossed a short time since. The ground is very favorable for working, and good headway is being made in general toward connecting the shaft with the bottom of the winze.

NORTHERN BELLE.—Eureka *Sentinal*, Dec. 14: The Northern Belle mine, Candelaria, instead of shutting down work as is reported ought to be able to pay off the recent judgement against it ($360,000) and go right ahead producing bullion. After the payment of thirty successive monthly dividends aggregating $1,450,000, the Northern Belle suspended dividends from Oct. 15, 1877, to May 15, 1880. Its product up to the last quarter of 1883 was $3,960,007. The dividends for this period have been thirty-three and have footed up $935,000. Furthermore, the surface property, consisting of large mills and a most effective reduction plant, with efficient hoisting machinery and an extensive water improvement and appliances, is particularly valuable while unquestionably the mine is not exhausted, either in its upper levels and almost untouched, as we have said, below 500 ft. The cash in the treasury, including unsold bullion, is fully $50,000. So far as we can see, there must be ample capacity in this property to pay off the judgement granted in favor of the Holmes Com-

pary, heavy as it is, with an ample margin for subsequent financial rehabilitation.

Esmeralda District.

ELNA.—Hawthorne *Herald*, Dec. 15: The 30 ton furnace has been in active and successful operation for a couple of weeks until last Wednesday, when a leak was spring in the bottom, and work stopped for repairs. It will be about the first of January before the furnace will be ready. The trial run demonstrated beyond a doubt that the smelter was a success. The company has purchased the old Montezuma mine, and are now developing it. They have sunk a shaft 300 ft, and have a tunnel in over 200 ft, which will have to be driven about 100 further to tap the ledge. There is an abundance of ore in the mine and Mr. Miller informed us that the short run just made by the smelter proved that it would pay handsomely.

AURORA The Silver Hill mill has just cleaned up after a run on New Esmeralda rock which averaged $33.50 per ton. Governor Blaisdell has had work done on the Humboldt West and that mine is looking better as the work develops the ground. The Silver Hill mill is now crushing ore from the Silver Lining, and Messrs. McKinlay & Grey intend to reduce 1,000 tons. It promises to yield them big profits. The Centennial, at the depth of 150 ft, running south on the ledge has struck it immensely rich. The ledge of this mine is 100 ft east of the Cortez.

PEACOCK.—The Peacock mine, Cory district, north of Spanish camp and 7 miles from Hawthorne, has one of the largest ledges ever developed. It is immense, averaging 50 ft in width, and the hanging-wall is well defined. The ledge is a vast deposit and is pronounced by miners to be nickel, showing a copper stain. The locators are pushing the development of this strange find and are awaiting returns of the assayer.

THE NEW BOSTON MILL.—Cor. *True Fissure*, Dec. 15: The writer has had a prolonged interview with a practical millman, L. McNeill, and his version of the matter is that the New Boston mill on its present site can never be a success. Where it now stands there is not a sufficiency of water to run on half time. The expense of laying a new main would nearly equal that of removing the mill, which would be 4 miles nearer this company's mines. By this removal the ores from the Sunrise, Tiptop and other mines could be easily taken to mill, altogether assuring a constant supply of ore. Mr. McNeill has inspected the mill, mines and spring of water, and says the water tunnel should be extended 20 or 30 ft. His estimate of the expense of removal and rebuilding to completion could more than be made up the first two months' run.

Paradise District.

PARADISE VALLEY.—*Silver State*, Dec. 14: The outlook of the Paradise mines is better by far than it ever was before. The mines which are being worked to any extent are looking remarkably well, and large bodies of high-grade ore have recently been discovered in the Paradise valley and Wild Goose. Where a year ago only the annual assessment work required by the laws of Congress was being done on mines, some 40 or 50 men are steadily employed, and the bullion product of the district, including ores shipped away for reduction, is about $25,000 per month. Since the burning of the Bullion Company's mill, a few weeks ago, there are only ten stamps crushing ore. These are at the Paradise valley mill, which produced last munth about $22,000 in bullion, and a greater yield is expected this month. In the Wild Goose there is a large lead carrying good ore as far as the mine is opened, and a large body of very rich ore was developed in one of the levels recently. It is estimated that there is sufficient ore in sight to run a ten stamp mill for six months. The Bullion, immediately adjoining the Wild Goose, has considerable ore in sight, and the company has made arrangements to open the lead 280 ft below the old works, at a point where good ore has been found. The upper level of this mine produced some $380,000 in bullion and it has not yet been worked 125 ft from the surface.

RATTLER.—The Rattler, owned by Marcott & Brannan, who are developing it by their own labor, is considered a very valuable mine, and it produces considerable high-grade ore. One car-load of it shipped to Salt Lake yielded $540 to the ton, and another shipment recently made to San Francisco was considered equally rich.

Pioche District.

COYOTE.—*Record*, Dec. 8: This new district is advancing to the front. It is in Bull valley, near Clover valley, on the line dividing Utah from Nevada, 75 miles from Pioche. Float was found in Bull valley by prospectors years ago, but where it came from could not be found. A few months ago ledges were discovered and a mining district formed, and a number of the claims taken up have opened out well. The ore carries both silver and gold, some of which is very rich.

GOLD MILL.—Dick Gillespie having purchased a gold mine in the lower end of this county is now preparing to erect a gold mill. The mine is the one discovered by John Huess some time ago, and is 18 miles south of El Dorodo canyon, and 10 miles back from the Colorado river. The assays Huess had made showed an average of over $30 in gold. Gillespie recently brought a lot of ore to the canyon and had it worked, which yielded over $130 per ton.

KINGFISHER.—Owing to great improvements made in the Kingfisher claim of Jackrabbit district during the week, the owners are greatly elated and are in hopes of opening up a large body of ore. The ore and workings prove almost to a certainty that such will be the case. The grade of ore has steadily improved as work progressed.

ARIZONA.

THE QUIJOTOA MINES.—Tucson *Citizen*, Dec. 8: Col. C. W. Tozer says: I never in Arizona, or on the coast, saw anything like it. Of course you need not put it that strong, because nobody can possibly believe it till they have seen it with their own eyes as I have. My individual opinion of the future of the property is that it will take rank among the great mines of the country; I was going to say in the world, but people abroad will dislike to believe that. The mines are 75 miles from Tucson in a westerly direction. The mines are situated on an isolated mountain, composed of porphyritic rocks, which rise abruptly from hights varying from 1,600 to 1,800 ft. Across this ledge extends the principal ore channel. It is a free milling ore, and can be worked by ordinary processes without washing. The ores are silver, carrying a small percentage of gold. From the limited amount of work done upon the mines, which work is confined to the Peer and Peerless locations, being the property recently purchased by Mr. Lyle for himself and others, I may say in general terms that the principal vein is from sixteen to twenty feet wide, and in places still wider, and never in the course of my observations in this Territory, or on the Pacific Coast, have I ever seen a more promising prospect.

RICH FIND.—The Benson *Herald*, says: Messrs. Wilson and Jackson, at a depth of four ft discovered a ledge eight ft wide, rich in free gold and silver. Mr. Jackson packed 100 pounds of the ore upon his burro and came into Tombstone and showed it to Ham Light, who had twenty-seven assays made of it, resulting in an average of $800 in silver, and $1,400 to the ton in gold. Since the results of the assays became known, about fifty men have left here and Tucson for this new district, and none of them have yet returned. It is thought that there will be from 150 to 200 men in the new camp within the next two weeks."

CONTENTION.—Prescott *Courier*, Dec. 7: The big pump at the Contention and Grand Central mines will start on the tenth. It will only require a few days to drain the mines, and the question of the character of the ore below the water level will be determined soon after.

CHICAGO MINE.—Prescott *Courier*, of Dec. 12: Another vein of rich silver ore was recently struck in the Chicago mine, six miles south of Prescott. It is fifteen inches thick and samples at the rate of $207 per ton. The gold vein, in same mine, is fifteen inches thick. Seventeen tons of it have just yielded $432 gold, with one ton of concentrates, worth between $400 and $500.

SILVER KING.—*Pinal Drill*, Dec. 8: In the Silver King Mill the boring machinery is in full operation. It is a mighty plunger that is lifted and falls with heavy weight on the rock it penetrates so as to make a twelve inch hole. They will go down into the bowels of the earth till they get where the water supply is steady and abundant.

The Jessie Bentun Mill leased to the Elmore Company at Owlhead started up on Monday last on ore of the By Chance and Lone Will mines.

GOLDEN RULE.—Tombstone *Epitaph*, Dec. 9: The mill is one of the finest ever brought to the Territory. The ore, as brought to the surface, has an average value of over $30 per ton. Every working shows ore nearly uniform in quantity and quality. Thousands of tons are blocked out for stoping, and the quantity in sight can be doubled as fast as power and drill can do the work. The daily output of the mine is producing a monthly net profit of from $20,000 to $23,000, which represents an interest of six per cent per annum on over $375,000, and with further development this output and consequent earnings can be doubled.

IDAHO.

ELKHORN.—Wood River *Times*, Dec. 5: The ore output of the Elkhorn mine the past season (from May 18 to November 27) was disposed of at the Philadelphia Co.'s smelters for the gross sum of $184,869.80, from which the net profit was $136,000. This, for a season of only 6 months, is a magnificent showing indeed for a mere "prospect."

MINEAR.—A. P. Minear left by train last night for the East, via San Francisco, taking with him some fine mining prospects, among which are four claims adjoining the Queen of the Hills mine, between this place and Bellevue, and two claims on Deer creek known as the We-met-by-chance, and the Vallejo. The four first mentioned are among the best properties on Wood river, and show ore carrying as high as $300 in silver.

GAMBRINUS LEDGE.—Idaho City *World*, Dec. 7: The Forest King ledge, in Gambrinus district, was tapped a short time ago at the depth of 200 or 300 ft. The tunnel was run in over 600 ft, and was an expensive piece of work. The rock all that distance was hard. The boys are now driving across the ledge pushing for the footwall, and have gone through 25 ft of low-grade ore, that is about as rich as the vein on the hanging-wall in the works above, the ore of which milled $35 or $40 per ton. Another vein of good ore will probably be tapped on the hanging-wall, as in the old works.

BAYHORSE.—It is the opinion of a good many that the mines of this district will surpass the Wood River bonanzas. One ledge has been discovered that is said to be 800 ft wide. Several claims on Thompson's creek have been recorded this season. Thompson's creek is a short distance above Squaw creek. There is some excitement in Custer county over the discovery of placers on "Squaw creek bottoms." A company of six men recently located claims—twenty acres each—and several claims have been taken up above these. The gold is rather coarse. They have not yet got down to bedrock, but expect to strike it rich when they do. "Squaw creek bottom" is about 30 miles this side of Challis.

BANNER.—Cor. *Statesman*, Dec. 8: The Banner mine has shut down for the season. They commenced to drop stamps July 13, 1883. The length of the run was 100 days; amount of rock run, 1,024 tons; silver produced, $107,648.83. It is seldom that a company from the East takes hold of any mining venture in the West and makes a success of it, but they have made a success of this one. They have expended for work, etc., since 1878, $250,000, but they have taken out a nice lot for it. The Banner mine will be further developed this winter by a shaft being sunk for double-decked cages at the head of the 600 ft tunnel. The mine never looked better than at present. It is estimated that there is enough ore in the stopes to keep the mill running day and night for the next three years. The Crown Point or Wolverine mines belong to this company, and will be further developed by two tunnels.

ATLANTA.—Judge J. D. Heath, the owner of the Washington mine, leaves to-day for San Francisco. The Judge has worked mines in the Atlanta district for the past 15 years. Last spring he started up to Atlanta, hired a man and commenced running a tunnel. Judge Heath is a small man, 70 years old, and will not weigh over 130 pounds. He wheeled out on a wheel-barrow every pound of rock taken from this tunnel, and prepared and helped set the timbers to timber it up. Some of the timbers he hauled down the hill with a rope, instead of using a team. They found a large vein of free gold, 6 ft wide, and are not through the vein yet. The rock will go $100 per ton, and some of it will go $1.50 a pound. Specimens which he showed us are perfectly covered with gold of the best quality, worth $20 an ounce. He has shut down work for this winter, but will come back from San Francisco early in the spring.

VIENNA.—Ketchum *Keystone*, Dec. 5: Another big strike is reported in the Vienna mine. The mine now employs 75 men. Thirty men are employed on the Mountain King mine, and 25 on the mill. Fifteen men constitute the winter force on the Solace mine. The Vienna mill continues to turn out a bar of silver daily.

TENDERFOOT.—Maj. Mensch has struck a body of sand carbonates in the Tenderfoot. The Rebble, now being worked by a few men shows an 18 inch ledge of good rock containing considerable quantities of fine ore.

Mr. J. C. Coulter, of the Philadelphia Co.'s counting room, has struck it fine on Elkhorn hill. He is interested in a bright prospect with Messrs. Greenhow and Rumsey. Samples of the ore discovered give an assay value of over 250 ounces.

CŒUR D'ALENE.—J. E. Carne writes from Fort Cœur d'Alene to the Wood River *Times*, of Dec. 8 as follows: "Don't attempt to make the mines by way of Heron siding, as that route was only reported feasible by the interested traders at that point. Rathdrum, 206 miles west of Garrison's is the only practicable route; from thence to the fort is 12 miles, a daily stage running direct to the Laketide hotel. It is going to be extremely difficult getting to the mines from the mission, as the Indians, who have the only means of transportation, are getting rich, drunk and obstreperous, consequently not to be depended upon. No one coming here before spring from Wood river need think of getting in for less than $300. In the spring one may be able to come for less."

The *Inter-Mountain* of Dec. 8th has the following: Al. Dell, of this city, is in receipt of the following letter from his partner in the Cœur d'Alene mines: "The Hays fraction is a 20 acre tract owned by Messrs. Dell, Wooden and two others. Mr. Dell is also interested in the Grub Stake and Last Chance. At present there is no way of getting into the mines but to travel on snow shoes, but the rush there in the spring will be unprecedented in the history of stampedes to gold mines in the West. The letter reads: Hays City, Idaho, Nov. 22d: Winter is upon us; the snow is a foot deep and I do not think it will go off this winter. We have no provisions in yet and I fear will be compelled to buy here at exorbitant prices. New quartz discoveries are being made constantly, and the leads promise well. All the placer ground that has yet been worked in the gulch has paid, and this is in my judgment the best camp on the American continent. Quite a number of men have bought ground here, and as high as $1,700 has been paid for a five acre tract.

The Salt Lake *Tribune* of Dec. 7th says: "Mr. B. Rolfson came in directly from the Cœur d'Alene mines yesterday. He made his way down from Eagle City to Cœur d'Alene mission—65 miles—in two days and a half. He struck the river five miles from Eagle City, and procuring an auger and ax he and his companions constructed a raft and came down the north fork on and through and under water. He is willing to make affidavit that there is no tougher journey anywhere. He reports that some 70 or 80 men came down the same way. All were as wet as drowned rats; some had lost their blankets, food—everything except their lives. Like the others Mr. Rolfson is going back in the spring, believes in the country thoroughly, and shows some beautiful nuggets as a corroborating evidence of his faith, and thinks he knows where more can be obtained. He thinks not more than 150 or 200 men will try to winter at the mines and that it is folly for anyone to try and go in there now. He believes with the disappearance of the snow plenty of quartz veins that are rich will be uncovered. The mines are only 12 miles from the British line, and the country beyond has not yet been explored. There will be plenty of room for prospecting next summer."

Two reliable experts just returned say: "The explorer leaves the Northern Pacific at Rathdrum, which is 300 miles west of where the Utah and Northern road form a junction with that road. From Rathdrum the route is by stage 12 miles to Fort Cœur d'Alene, then by steamer 60 miles is made half on the lake and half on the Cœur d'Alene river to the old Cœur d'Alene mission. The snow is already quite deep all over the country. After the snow had fallen a three days' rain succeeded, which closed in another snow storm, and the result is a trail which the hardiest mountaineers stand appalled before, for it leads through a dense forest, fallen timber, swamps and sagebrush. This underbrush is a kind of black thorn which is simply horrible to get through. To make it the more difficult all the first parties going in blazed the trees on the routes they were following; many of them lost their way and blazed the trees on the way out, and the result is hellenblazes on anyone who tries to follow their tracks. The condition of these trails makes it almost impossible for pack animals to get in, although the charge is ten cents per pound from the mission to the mines. The poor animals mire down, break their legs among the logs—many such accidents have happened—and others perish from cold and want of food. There is not a particle of food for animals on the route. It will be a serious, if not impossible thing to get anything more packed in this season. By the time the spring opens a new broad trail will be cut from the mission, via Jackass prairie. This will cross the Cœur d'Alene but twice; at one crossing there will be a bridge, at the other a ferry. It will be seen that the whole distance from the railroad is 116 miles; 60 by water and 56 by land, the last 44 of which is by a worse trail than the oldest California miner ever tried. Pritchard's gulch is 20 miles long, and from 200 to 500 yards wide, falling about two ft in 100. The slate crosses the stream at nearly right angles, and the jagged slate makes natural riffles which have caught the gold. Most of the gold is coarse, and many large nuggets have been found. On Pritchard's gulch prospects have been found for 15 miles. The gold is worth $16.50 per ounce. Eagle creek is ten miles long and from 200 to 500 yards wide. Good prospects are reported at the lower end. Beaver creek is 18 miles long. Some prospects have been found along this creek, but bedrock has not yet been found.

MONTANA.

ALICE.—In answer to an eastern stockholder's request for information in regard to the condition of the Alice, made of the New York *Engineering and Mining Journal*, we give the closing paragraph of an article in the *Inter-Mountain* of Dec. 7: The condition of the mining properties of the company is entirely satisfactory. The ore supply is abundant and reliable; the mines are worked under the direct personal management of a competent superintendent; the percentage of chlorinations and savings, or amalgation, in the mills are high and the outlook for the future is hopeful in the extreme. Of course the report that the mills are running on 150 and 200-ounce ore is rot. There is no large body of such ore in the world. The Alice company, however, has been paying off a heavy indebtedness, has labored under all the disadvantages of high freight rates, which only recently have been reduced and has been otherwise under heavy expense. The *Inter-Mountain*, however, is firmly of the belief that dividends will soon be resumed and that the Alice will be again recognized as one of the leading silver properties of the West. "Stockholder" has no occasion to be alarmed.

FISH CREEK.—*Inter-Mountain*, Dec. 10: We referred, not long since, to the fact that some placer discoveries of prominence had been made on Fish creek, some twenty miles from this city. To-day in conversation with Mr. J. W. Shields, an *Inter-Mountain* reporter gleaned the following:

The gulch is eight or ten miles in length, and has been nearly all taken up in 20-acre claims. It is four or five miles below the mouth of Highland gulch. Mr. Shields reports that he and his partner have prospected the ground at different places along the gulch and have obtained as high as one dollar to the pan. The gravel is ten ft deep and pays from the grass roots to bedrock. The gulch is admirably situated for mining, there being sufficient fall to work the ground with hydraulics. At present there are 1,000 inches of water in the creek, and this volume will be increased to 4,000 inches in the spring. Mr. Shields is confident the gulch will pay as well as any opened in the country and expresses the conviction that having talked with men who visited the Cœur d'Alene country he regards the Fish creek discovery as the most valuable of the two.

PHILIPSBURG.—Cor. of Butte *Miner*, Dec. 5: The Algonquin mill is running steadily on Trout and custom rock. Superintendent Incamp shipped five bars, the result of last week's run, to Helena, and will probably make a similar shipment during the present week. All of the ore treated so far is very low grade, barely meeting expenses. The Hope mill is fully equipped for work. About 300 tons are in the ore-house ready for the batteries, which will drop on December 1st. Frank L. Perkins, the Superintendent of the Granite mine, informs me that everything is progressing well. The Burleigh drills are doing good work in the lower tunnel, but owing to the solid and compact nature of the country rock the advance per diem is not as great as at first expected. The San Francisco tunnel is in 400 ft, with about 100 more to run to finish the contract. The face shows three and a half ft of ore, assaying from 50 to 600 ounces per ton.

NEW MEXICO.

STEEPLE ROCK.—Cor. Silver City *Enterprise*, Dec. 1: J. H. Kistler is working a full force of men on the Nugget, and upon reaching the 200 level he will commence crosscutting and drifting. The Nugget is the best developed mine in camp and is being worked on a more extensive scale than any other. Shaft No. 2, which has been sunk to a considerable depth, is about 300 ft east of the discovery shaft and like it has been sunk in good ore entirely.

Cadwell, Brown & Shehan have recently commenced work in the Rain-in-the-Face. This mine is nearly as well developed as the Nugget. They are taking out an abundance of rich ore, which contains horn and brittle silver and free gold. The owners will continue to work this and other properties in the district during the winter. The Rain-in-the-Face is attracting a great deal of attention among mining men, and will prove itself to be a big mine. The ore is free milling and in a 100 ft shaft recently sunk there was not over 3 ft of the shaft in any place but what went down in good ore. It is expected that work will soon be resumed on the Gold Note, a promising prospect west of the Nugget and upon the same ledge. Some Texas capitalists while recently doing 100 ft of work on this claim struck a large body of rich ore. At last the long looked for event has happened at the Carlisle. An abundance of water has been struck in the main shaft at a depth of 340 ft and in the future the output will be more than doubled. It is a difficult matter to get the output of this wonderful property, as it is a close corporation and they keep their business from the public. Sometime ago an item was published that a 12 day's run of from 5 to 10 stamps, according to the stage of the water, amounted to $12,000 but it has been stated that this was considerably under the real figure.

SILVER CROWN.—The largest body of lead carbonate ore ever uncovered in this section of the country was exposed on the Silver Crown claim, in Hanover gulch last week. The lead is 9 ft in width and in many places still larger. The claim is owned by H. J. Hutchinson and James C. Woodward. The property was formerly owned by the late Judge Pierson and was worked many years ago, but the main ledge was never discovered until last week. From numerous assays made by Mr. Woodward the ore is found to contain an average of 55 per cent lead and from 50 to 300 ounces in silver. The lead contained in this ore alone, is sufficient to flux the most refractory mineral to be found in this section, and as the mine is located but one mile from the Ivanhoe smelter the product will find a ready market.

HACHITA.—Deming *Tribune*, Dec. 6: B. Y. McKeyes, reports a recent find in the Apache district of a three-feet vein of high grade ore, a part of it running 380 ounces in silver and 40 per cent lead. The Dug Out boys are making a success of the adobe smelter, which they have recently got started for steady business. Two pairs of bellows furnish the blast. In thirty-six hours they run out 1,200 pounds of 300 ounce bullion and were running steadily up to the time he left. They declare themselves wholly independent of capitalists now.

For Mining Shareholders' Directory, Stock Reports, etc., see page 404.

Collecting Flue Dust, No. 5.

Fig. 16 shows the arraugement of Fig. 11 when only six sheets were used; Fig. 17, the arrangement of the same flue when 17 are used. A vacaut space is left, as C E C L in Fig. 17, to show the method of hanging in the sheets on the iron bars L, as well as the method of supporting the partitions on the bottom of the flue. In order not to impede the draft these plates must be placed parallel to its direction, and be as thin as possible. It will also be necessary to place them as nearly vertical as possible so that when the dust coudenses upon them, after it has attained a certain thickness, it will fall dowu upon the floor of the flue and remain there. Iu order to bring the quantity of dust which settles up to a maximum, the material which has once beeu condensed and brought to rest, should remain, as far as possible, where it was arrested, or if allowed to move should fall vertically on to the floor, and remain there, so tbat it would no longer he possible for it to be caught up again by the draft and be carried up the chimney.

The Simplest and Cheapest Means

Of effecting this is to make partitions, about 50 cm. high aud nearly touching the vertical sheets, across the bottom of the flue, as is sbown at E, Figs. 16 aud 17. Every five or six meters, or less, partitions are made at right angles to the direction of the draught. In the first experiments they were made of stone, laid up dry, as shown at E, Fig. 16. It has been found best, iu the more recent constructions, to make them of sheet-irou, as is sbown at E, Fig. 17. The sheet-irou is supported in wrought or cast-iron feet C, to which it is attached by bolts. It is easily set oue side when the flue is cleaned, or can he quickly removed from the supports if it is for any reasou necessary to do so. This kind of constructiou has tbe advantage of uot only being easily removed aud replaced, and of being quickly repaired, but it is never in the way. The dust collected is purer, because there is no chance of having small particles of broken stone mixed with it. This method of using plates for increasing the condensing surface costs very little, as any kind of sheet-iron can he used. By the ordinary construction one meter of the leugth of the flue gives only 8.22 square meters of surface; altered in this way, the same length gives, with six plates 65 square meters of surface, and with seveuteen, 184 square meters, while its volume is lessened only a very little.

Iu all parts of the flue where these sheet-iron plates have beeu placed,

Enormous Quantities of Dust

Have been found every time the flue bas been cleaned, the quantity being greater as the surface was larger. As uo such quantities have been found before, and as the increase in quantity is directly in the ratio of the increase of the surface, there is every reasou to believe that it will prove effectual up to a limit wbich has not yet been ascertained. The quantity of dust collected, especially in the last section of the flue, was very large. Usually, but very small quantities can with certainty be counted on in that position. It seems probable that by the use of a suitable construction, a still larger part of the dust cau be collected, and most of that which is now lost saved, tbus diminisbing the expenses and increasing the receipts of the works very considerably. With regard to the number of sheets to be introduced iu each section of the flue to produce a maximum effect, it may be said the more the better, provided they do not interfere with the draft. It has been found best to use very thiu sheets, and to concentrate them, as far as possible, in a small portion of the flue, rather than to scatter them throughout it, or over a very large part of it, as the cost of construction will for this reasou be less. Up to the end of the ninth campaign they were hung .01 m. apart. So much dust was then collected in Sectiou VI by this method that the flues became choked aud the furnace had to go out of blast. The plates can only be hung so close together at the end of the flue without endangering the length of the campaign, uuless auxiliary flues are provided, as has been suggested, so tbat the sections may be cleaned whenever desirable by turniug the gases into the auxiliary flue, aud when that is full, back again, without stopping the works. No general rule cau be given either for the number of plates nor for their relation to the width of the flue, for the quantity of gases passing through it, or the quantity of sublimed material likely to be contained in the gases. They uot only differ in the different works, but they are often different in individual parts of the same works. The use of sheets thinner than .675 mm. would give more surface for the same volume, but they would have to be supported differently, as they would be likely to be moved from side to side by the blast. If they were hung from the top there would be danger of their meeting at the bottom, aud thus obstructing the draft. To support them in more than one place would naturally increase the difficulty of using them, as well as the cost. The introduction of three or four more in the same space would largely increase the surface, but could not be done advantageously if it increased the difficulty of manipulation, or the cost at the same time. More plates would then have to be used in the length of the flue. The cause of failure, if any, in the system would be the increase of friction-surface, and this limit would have to be found in every case. Whether it will be wise to increase the section of tbe flue in order to introduce more plates can only be ascertained by experiment. When careful records of the action of each shape of flue, where the plates are used, have been made, the ledger account will soon show which form of flue it is most economical to adopt.

The Material Used for the Plates

May be different according to the temperature which obtains in that part of the flue where they are to be used. Thin sbeet-iron seems to be the best, which need uot even he new. The worn-out iron sieves of the jigs from the dressing-works can be used, and where the temperature is very low, as in the last section of the flue, next the chimney, on the hill, pasteboard can he used. Combustible material cannot, of eourse, bc used where the flue is to be fired. It would be best, however, to make experiments in each case as to what material will be most suitable.

Whether these plates can he best hung up or fixed permanently, as well as tbe best way of carrying out the rest of the system, must he determined in each special case. It will generally be found best to have them easily removable, to facilitate the firiug of the dust (which is peculiar to the works at Ems), as well as to facilitate the cleaning of the flue.

In England a patent was taken out in the year 1880 for plates which are put in horizontally. The object of this invention is to collect the dust by making the draft as slow as possible and causing the particles arrested to fall the shortest possible distance. To diminish the velocity of the gas, it is passed from the main flue into very large condensing chambers built at the side of the main flue, and divided by parallel walls into a large number of flues, in which iron plates are placed horizontally and close together the whole width of the flue, so as to make the fall of each particle as small as possible. There is no doubt that, so far as the collection of the dust is concerned, this system will do it rapidly, but the system itself is both defective and expensive. As the dust is accumulated in horizontal layers, the volume of the flue is rapidly diminished, and as there is no provision made for arrestiug the dust where it falls, the amount of surface must always be a maximum. It will take a long time for such large condensing chambers to cool down so that the men can enter them, so that much time will be lost before they can be cleaned. The danger to the men by bringing them in contact with this impalpable dust, which is set in motion every time one of these layers is removed while cleaning the flue, will effectually prevent the general introduction of this method.

Asbestus.

Occurrences.

Asbestus is found, usually in small quantities, in very many localities in this country. The great difficulty connected with the economical mining of tbis substance has been that the deposits are generally small pockets. Both hornbleude and pyroxeue asbestus occur, the former being the more commou, though it is often difficult to distinguish between these varieties. Most of the bisilicates, excepting those containing much alumina, pass into fibrous varieties, all of which are known as ashestus, though the term "amianthus" is sometimes applied to tbe finer and more silky kinds. The leading localities at which asbestus is or has been mined are Rabun and Fulton counties, Georgia; also localities in northern Georgia, western North and South Carolina, Staten Island, Long Island, and other localities in New York State, Maryland, northern New Jersey, Penusylvania and Virginia. Small quantities of good quality have also reached the market from Colorado, and the occurrence of the mineral is noted in many of the Territories.

There are very many places in California and Nevada where asbestine deposits are found. In San Bernardino county, near Agua Caliente, San Diego county; Salt Spring Valley, Calaveras county; Placer county, and at several other points in California deposits have been opened. While the mineral in some of these localities occurs in great masses and is remarkable for its length of fiber, it has generally been lacking in fineness, flexibility, or other desirable properties. For these and other reasons, such as the cost of mining and transportation and the limited local demand, the home product has not been able to compete with imported and Eastern asbestus in the San Francisco market, notwithstanding its lower price, that of the raw material varyiug from $30 to $35 per ton. Deposits of the different varieties of the mineral have beeu found at a number of other places in the Pacific States and Territories, but so few of them have ever been developed that in regard to their value or character little is known. Asbestus seems to be abundant enough in this region, but it is difficult to find it in such a form as to be acceptable to the purchasers.

Production, etc.

The production in the calendar year 1882 is estimated at 1,200 tons, of an average spot value at the mines of $30 per ton. It is expected that larger quantities will be mined in the future, and that the product can be put upon the market at a lower cost. The price at New York reaches from $15 to $60 per ton, according to purity and length and strength of fiber. The imports of crude asbestus during tbe fiscal year 1882 were 383 tons, invoiced at $14,235. The exports of manufactured asbestus were $18,923.

Relative Value of Asbestus from Different Countries.

As a rule, American asbestus is inferior in textile quality, being more brittle and harsh in fiber, as well as shorter than that imported, and is therefore not so well adapted to the manufacture of spun and woven goods. It is stated that the quality of the domestic is constantly improving, new sorts being found almost every month. There appears to be little difference between the domestic and foreign in point of fireproof qualities, though some manufacturers report as a general thing the domestic ashestus will stand a higher degree of heat. The American is better adapted for making fireproof cements and paints, for which purposes it is generally used, length of fiber being unessential. The greater part of the imported mineral comes from the province of Quebec, Canada. The Canadian asbestus sells in New York at from $25 to $90 per ton, the usual range being between $40 and $75. The Canadian is said to be the best for general use. Asbestus is also brought from Italy and Austria. A little exceptionally fine Italian asbestus bas sold as high as $250 per ton, though the price is usually about $100. The Italian is the finest for textile purposes, but on account of its higher price it cannot compete with either the Canadian or the domestic.

Ashestus is used in making liquid and fireproof paints, roofing, piston packing, valve packing, flat packing, covering steam pipes and boilers, fireproof cements, sheet and roll millboard, flooring, felt, etc. It is often used in combination with hair felts and other substances.—*Williams' Mineral Resources.*

Lithographic Stone and Lithographs.

A California Quarry.

The reported discovery in this State of a ledge or quarry of the peculiar stone used by lithographers has drawn some attention to this subject, both from an artistic and husiuess standpoint, and we condense the following from an article in the *Call*, in relation to the matter.

The best stones employed in lithography are slabs of a light colored, slaty, argillacious limestone, found in very extensive beds at Solenhofeu, near Poppenheim, Bavaria, on the Danube. These were the first and only ones used by Senefelder, the discoverer of the art. The rock belongs to the upper oolite, and occurs in sbeets and slabs of various thicknesses. It is exceedingly fine graiued, formed evidently of the finest sediments; its fossils are, many of them, of the most delicate character, amoug them being found insects intermixed with other animal remains of a marine class. Other countries have also furnished lithographic stones, as those from cretaceous formation of Belbeze, Haut-Garonne, in the French Pyrenees, claimed by some to he barder and better than the Bavarian; but the jury of the Freuch Exposition in 1855 set this claim at rest, as well as those from Algeria, Italy, Portugal France and Canada, by awarding the superiority in the aggregate of good qualities to the Bavariau stone. Until within a very short time no discovery of lithographic stone had been made in the United States.

The Lithographic Art

Was introduced into America in 1821, and was first practiced by Messrs. Barnett and Doolittle in New York.

All the stones used in this country are brought from Germany, and to give some idea of the importance of the trade it may he stated that the importation is at the rate of thirteen and three-quarter tons per day, the valuc of the same for the year being $4,892,430. On an average 13,100 cubic yards of this stoue are quarried annually in Bavaria at a cost of $1,000,000; the returns reach $10,000,000. The large proportiou of this product taken by the United States shows how generally litography is used in this country.

The Reported California Quarry

Is in Kern county, about six miles from Tehachapi Pass, on the crossing of the Southern Pacific railroad, where the surface of the country is level, and the route from the railroad to the quarry good. According to the representations of the discoverers of this valuable material, the formation passes through the mountain on the south side of the ravine, which cuts it, and the stone appears again on the north side showing a ledge half a mile in extent, and of considerable thickness, judging from the croppings. There are, however, as yet, no developments in depth. As in the Solenhofen mines, there are two qualities and shades of color in the stone found in Kern county, and those in this city who fully understand the business of lithography, including all our engravers, are quite sanguine that we have a stone quite as valuable for eugraving purposes as the German. This is an important fact. The quarries in Bavaria are said to be rapidly giving out, and till this discovery in California, no true lithographic stone had been found in the United States. In Kentucky and Canada, quarries of impure brittle stoue, resembling the German in character, have been found, but test proved it valueless for engraving purposes, and it therefore has comparatively little value. San Francisco, alone, uses $6,000 worth of lithographic stone, annually, all, of course, imported from Germany, although, according to Mr. Edward Bosqui, the well known lithographer of this city, from whom many of these facts are derived, the Solenhofen stone is gradually deteriorating as the quarries are being deepened.

The Lithographic Engravers

In the large Eastern cities, particularly New York, Cincinnati and Buffalo, where the principal show-bill printing is done, have of late built up very profitable businesses; though, occasionally they meet with a set-back from not being able to procure a sufficient quantity of stone for their work. The Strohridge Compauy of Cincinnati, is a remarkable instance of winning success against adverse circumstances. Strobridge himself is not a practical lithographer, and the fate of his venture was for a time uncertain. Finally, A. A. Stewart, who used to be a curio purveyor for Barnum, took hold, and brought a good deal of hard sense to bear on the matter. He opened an office in Twenty-third street, New York, and so exerted himself that the Strohridge Lithographic Company is now a big concern. Stewart receives ten per cent of the gross proceeeds of the business, and last year his income from this source amounted to $33,000. The Strobridge Company has been thriving for ahout four years. The *Courier* Company, of Buffalo, is also another flourishing lithographic concern. Wide as the practice of the art is in the United States, it still appears to he growing, as we notice that the Strobridge Compauy have lately been compelled to procure artists from Loudon, bringing their families as well. These artists are paid a tidy salary of nearly $10,000 a year, and would not leave home till that amount was deposited to their credit in a London hank as a guarantee of good faith. Thomas, of New York, is another leading establishment, the specialty of whicb, as of a great many other lithographers in that city, is fine insurance work.

When you admire the handsome chromo-lithograph of the scenes of a play, that meets your eye on the wall, you may as well know that it takes thirty-six stones to make a nine-sheet bill, (the size generally used) and the cost of each stone is about $75. The most perfect stones are required for crayon drawings. The famous designer, Matt Morgau, is considered the best artist for theatrical work in the United States; but of late years he does little more than superintend and direct a corps of artists under his control. The price paid for show-bill work is eight, nine and ten cents a sheet of 28x42; but at this rate the order must be for a number of copies, say two thousand and upward. The cost of lithographing is less thau one-third that of copper plate engraving, and 80,000 impressions may be taken from a coarsely drawn stone without deterioration.

In the usual practice of the art, the lines which receive the ink are composed of a greasy substance. This is applied with a pen, crayon, or a brush to the stone. The inky material is then washed with a weak acid solution, which has the effect of hardening it, and also cating away slightly the stone not protected by the ink. Water is then applied which wets the clean portiou of the stone, leaving the greasy lines dry; and after this the lithographic ink, made of old lard, white soap, white wax, shellac, mastic, Venetian turpentine, carbonate of soda and pulverized Paris black, laid over the whole, adheres only to the greasy lines. Chromolithography —so much used by traveling theatrical companies—was invented by Engelman of Paris, and is simply the printing of colors by the use of a succession of blocks, each having a single color, distributed in appropriate places. Lithographic blocks are about four inches and a half high, and are gradually worn thinner, as a new surface is made by rubbing off the old for a new drawing.

Recent Contributions to the California State Mining Bureau.

[Furnished for publication in the MINING AND SCIENTIFIC PRESS by HENRY G. HANES, State Mineralogist.]

[CATALOGUE.]

5102 Silver Ore—Capital mine, Santiam River, Oregon.
5103. Iron Ore—Typical specimen of the Oswego iron mine, seven miles from Portland, Oregon. J. S. Holtt.
5104. Lava and Olivine—Five miles above the Dalles, Oregon. Mrs. A. Boyd.
5105. Coal—Washington Territory.
5106. Priceite Borate of Lime—Calico, San Bernardino county, Cal. S. Heydenfeldt, Jr.
5107. Pyrolusite, of excellent quality—Sonoma county, Cal. M. F. Truitt.
5108. Pyrrhotite—Colorado.
5109. Cellular Lava—Captain Jack's Cave, Modoc Lava Beds, Modoc county, Cal. Dr. F. G. Hearn.
5110. Stove Leg of Cast Iron, run direct from the stack—Oregon Iron Company, Oswego, Clakamas county, Oregon. From the company.
5111. Copper and Slag—The result of working ten pounds of ore (No 2730), Wier copper mine, Pueblo Valley, Humboldt county, Nev. One ton contains 450 pounds metallic copper. J. C. Wier.
5112. Cake of Sunburned Clay—Reno, Nev. R. V. Borden.
5113. Silver Ore—Big Bonanza mine, Frisco, Beaver county, Utah.
5114. Obsidian—Snake River, Idaho. Wm. Quayle.
5115. Salt—Mud Volcanoes, San Diego county, Cal.
5116. Magnetite—Locality not given. Mr. Putnam.
5117. Silver Ore—La Union mine, El Bolcs district, Sinaloa, Mexico. F. E. Monteverde.
5118. Cane made from a piece of Commodore Perry's flagship St. Lawrence, in which he fought the battle of Lake Erie, September 10, 1813. Capt. H. A. Gorley.
5119 Marble (Brocatella), 3 varieties. J. Z. Davis.
5120. Chromic Iron—Southeast quarter section 21, township 14 north, range 9 east, Placer county. R. L. Dunn.
5121. Volcanic Rock—Oahu, Sandwich Islands, Sea Shore.
5122. Volcanic Rock (Basalt) 5 varieties—Manna Valley, Oahu, Sandwich Islands.
5123. Basalt with Olivine—Manna Valley, Oahu, Sandwich Islands.
5124. Silver-Lead Ore—Dean Richmond mine, Tombstone, Pima county, Arizona. J. G. Manning.

Sulphur.

Occurrences.

Native sulphur is found in Nevada, California, Utah, Virginia, Louisana, and other portions of the country, occurring in beds of considerable size in Uintah County, Wyoming, near Evanston, where it is said to be quite pure; and also in some quantity in the Yellowstone Park, Montana, and in various localities in New Mexico. Sulphur springs are of common occurrence throughout the Rocky Mountain region.

Production.

Sulphur is only worked to any extent in California and Nevada, and not on a very large scale in these States. In the census of 1880 the whole production of the United States for that year, 1,200,000 pounds, worth $21,000, is credited to Nevada.

Sulphuric Acid.

In the census year 308,765,432 pounds of sulphuric acid, worth $3,661,876, were made, by far the greatest proportion of which was made from Sicilian sulphur, with a little from pyrites. New Jersey and Pennsylvania lead in manufacture of sulphuric acid, followed closely by Maryland, New York and Ohio. Sulphuric acid is made in almost every State to a greater or less extent. It is certain that the manufacture of sulphuric acid from pyrites for making superphosphates will become a very important industry in the Southern States, while the use of pyrites in works in the neighborhood of New York City is steadily increasing. It is thought by some persons that in time all or nearly all of the sulphuric acid made in this country will be manufactured from pyrites, and that acid made by burning brimstone will not be able to compete with that produced from the cheaper source, at least in the market for common commercial acid.

Foreign Sulphur.

Nearly all of the imported sulphur comes from Sicily. A small quantity has been sent from Japan by way of sample and perhaps 1,000 tons of sulphur recovered from the waste of chemical works in England are imported annually. Dealers report that as yet the Nevada sulphur has not been able to compete in price with the foreign in the market of the Eastern States on account of the high cost of transportation, which, in the case of Sicilian sulphur, is comparatively a small item, as the mineral is often brought as ballast in vessels carrying cargoes of lighter goods. The price of domestic sulphur in San Francisco is about the same as that of Sicily brimstone of the same quality laid down in New York. American sulphur appears to be irregular in point of quality. Some samples handled by Messrs. M. Kalbfleisch & Sons, New York, are stated by them to have been fully equal, if not superior, to the Sicilian, while on the other hand some of the refiners who prepare sulphur for pharmaceutical purposes report that the domestic sulphur sometimes contains traces of arsenic, which would render it unfit for this special use. The price of Sicilian per ton of 2,240 pounds at the close of 1882 was $27.50 for best unmixed seconds, and $26 for best thirds. The price fluctuates considerably, and has declined from the rates ruling earlier in 1882.

The following tables show the extent of the foreign trade during recent years:

CRUDE SULPHUR OR BRIMSTONE IMPORTED INTO THE UNITED STATES DURING THE FISCAL YEARS SPECIFIED—SPECIE VALUES.

[Free of duty.]

Years.	Tons.	Value.
1872	27,556	$765,024
1873	45,340	1,300,626
1874	41,539	1,260,140
1875	39,584	1,255,100
1876	48,966	1,473,678
1877	43,443	1,342,788
1878	47,922	1,173,156
1879	65,919	1,487,698
1880	83,236	1,927,502
1881	105,438	2,713,494
1882	97,956	2,027,402
Calendar year 1882	101,595	2,674,449

REFINED SULPHUR IMPORTED INTO THE UNITED STATES DURING THE FISCAL YEARS SPECIFIED—SPECIE VALUES.

[Dutiable.]

Years.	Cwts.	Value.
1872	2,027	$4,795
1873	2,117	5,180
1874	1,709	4,129
1875	535	1,399
1876	2,375	5,098
1877	20,030	48,868
1878	6,628	14,924
1879	5,123	10,963
1880	3,180	5,530
1881	2,672	6,124
1882	7,891	15,651
Calendar year 1882	6,895	13,578

SULPHUR EXPORTED FROM THE UNITED STATES DURING THE FISCAL YEARS SPECIFIED.

Years.	Crude.		Refined.	
	Tons.	Value.	Cwts.	Value.
1872	....	....	103	$270
1873	5	$302	224	1,062
1874	....	....	....	....
1875	....	....	130	344
1876	....	....	....	....
1877	....	....	1,086	2,088
1878	....	....	....	....
1879	....	....	39	98
1880	....	....	94	221
1881	....	....	....	....
1882	....	....	687	1,321
Calendar year 1882	....	....	979	1,973

—*Williams' Mineral Resources.*

A SWEET potato raised in the Santa Ana Valley, Los Angeles County, is three feet four inches in circumference and weighs 34½ pounds.

USEFUL INFORMATION.

Quick Growing Trees for Fuel.

Many located on prairie farms plant hickory, walnut, hard maple and white oak trees with the expectation of providing fuel to use in a near future. Unless they reach very old age, the prospect of their ever sitting round fires built of wood obtained from trees of their own planting is very poor. The trees spoken of produce excellent wood for fuel, and it is advisable to plant them if one designs to produce fuel for another generation. The trees grow very slowly, however, even when the soil and location are well adapted to them. Admitting that the wood of these trees is worth twice as much as that of trees that make a rapid growth, it is advisable after all to plant the latter. Few people are aware of the great difference in the increase of size of the hard and soft wood trees. If they would set a hard maple and a gray willow within a few rods of each other they would in a few years find the latter fully twenty times larger than the former. No variety of willow furnishes wood of very good quality, but several of them produce a large amount in a very short time. The trees are propagated from roots or cuttings and require little care. The wood has a few advantages. It is easy to cut, seasons quickly and kindles readily. It makes a fair fuel for cooking purposes. It also makes a good charcoal, which is excellent for light fuel as well as for many other domestic purposes.—*Chicago Times.*

OUR RUBBER INDUSTRY.—The rubber industry of the United States has little rivalry in foreign countries. There is something like $75,000,000 invested in the business of manufacturing rubber goods, $30,000,000 of which is confined to the rubber boot and shoe industry. The total number of employees is placed at 15,000, and the total number of factories at 120. According to a recent census bulletin, the value of the annual product is $250,000,000. Some 30,000 tons of raw rubber are imported every year, which, when combined with other materials in manufacturing, amount to 300,000 tons. The market price of the raw material has been forced up to $1.25 per pound, while six years ago the price was scarcely fifty cents. In consequence of the advanced price of rubber, several substances have been prepared as substitutes for it, of which celluloid is the most important.

THE APPETITE OF A BIRD IS WONDERFUL.—If a man could eat as much in proportion he would consume a whole round of beef for his dinner. The redbreast is a most voracious bird. It has been calculated that to keep a redbreast up to its normal weight an amount of animal food is required daily, equal to an earthworm fourteen feet in length. Taking a man of average weight, and measuring bulk for bulk with the redbreast, I tried to calculate how much food he would consume in twenty-four hours if he ate as much in proportion as the bird. Assuming a sausage nine inches in circumference to be a fair equivalent of the earthworm, I find that the man would have to eat sixty-seven feet of such sausage in every twenty-four hours. I mention this in order to illustrate the amount of work which is done by insect-eating birds.—*Prof. Wood*

THE HONEY BEE has long been a type of the industrious worker, but there are few people who know how much labor the sweet hoard of the hive represents. Each head of clover contains about sixty distinct flower tubes, each of which contains a portion of sugar not exceeding the five-hundredth part of a grain. Some apiarian enthusiast, who has watched their movements, concludes that the proboscis of the bee must therefore be inserted into five hundred clover tubes before one grain of sugar can be obtained. There are 7,000 grains in a pound, and as honey contains three-fourths of its weight of dry sugar, each pound of honey represents 2,500,000 clover buds sucked by bees.

GILDING LEATHER.—The following method is given for gilding leather: It is first moistened with a sponge, then stretched and tacked on a board. When dry it receives a coat of thick isinglass solution, then one of white of egg that has been beaten and allowed to settle. Upon this is laid lightly with a brush sheets of silver foil, which are then pressed down with a wad of cotton wool. When this is dry it is painted over with yellow leather varnish, which gives it a beautiful golden appearance. A varnish for bronze boots and slippers is made by dissolving aniline red in shellac or other varnish.

TO RENDER SACKCLOTH IMPERVIOUS TO WATER.—Sackcloth or canvas can be made perfectly impervious to moisture, equal to leather, by steeping it in a decoction of one pound of oak bark with fourteen pounds of boiling water. The cloth has to soak twenty-four hours, when it is taken out, passed through running water, and hung up to dry. This quantity is sufficient for eight yards of stuff. The flax and hemp fibers in absorbing the tannin, are at the same time better fitted to resist wear.

REMEDY FOR LEAKY PENS.—A correspondent of the *Scientific American* says: The stylographic pen is a great convenience, but no inventor seems to have succeeded thus far in making a joint which will prevent soiling the fingers with ink. A remedy for this leakage, which has been tried and thus far seems to be complete, is to rub the joint on which the fingers rest with the thin edge of a piece of wax. Hold the pen over a candle, lamp, or the flame of a match till the wax melts, when it will lute the joint so that no ink can escape through it.

PRESERVING AUTUMN LEAVES.—The leaves may be preserved between sheets of blotting paper, which should be changed at intervals until the leaves are thoroughly dried, in order to prevent rotting. The colors then look dull, but may be wrought out by either oil or thin varnish or wax. The leaves may also be rubbed with wax and carefully pressed with a warm—not hot—flat iron. By carefully rubbing with the edge of the iron they may be made to curl in a very natural manner.

TO POLISH EBONY.—To put a high polish on ebony, one that will be durable, give the work two coates of fine copal varnish, and rub this down, when quite dry, smooth with fine pumice stone; put on a third coat of the same, and rub down with rotten-stone; clean and put on a flowing coat of best spirit copal varnish, and when this has become quite dry, polish with chamois skin and the palm of the hand.

SEWING MACHINE POWER.—An ingenious English manufacturer has, by a simple and workable invention of coiled spring, succeeded in dispensing with the need of driving sewing machines by hand or foot. A few turns of a handle winds up sufficient power to keep a machine going at full speed over an hour. It is completely under control as to the rate of stitching and stopping, and can be applied to any existing machine at moderate cost.

A GOOD CEMENT.—Persons who use brass letters on glass windows or doors are often troubled by the dropping off, from unequal expansion, or from too violent efforts on the part of window cleaners. The following is said to be a sure cement. It should be mixed just before using: Litharge, two parts; white lead, one part; boiled linseed oil, three parts; gum copal, one part.

ANKLE GUARD FOR INTERFERING HORSES.—The cheapest and best ankle guard for interfering horses is made of ¾-inch new thin rubber hose. Get the length around the ankle (not a tight measure), cut the hose accordingly, and run inside a strap and buckle. Thus for a few cents you get a boot as good as one for which a dealer would charge $1.50.

SPIDER SILK.—French silk manufacturers are reported to be very hopeful as to the capabilities of a big spider lately discovered in Africa, which weaves a yellow web of great strength and elasticity.

GOOD HEALTH.

Trained Nurses.

We find in the last number of the *Medico Literary Journal*, published in this city, an article on the subject of trained nurses. The matter is a most important one, and should more fully engage the attention of medical men and the public generally. We believe some attention is already being given to the matter in this city—but the effort thus far has been a comparatively feeble one, and is not seconded as it should be by those most interested.

We learn from the article above alluded to, that at the recent meeting of the American Medical Association, at Cleveland, Ohio, Dr. S. D. Gross, a well-known physician of Philadelphia, offered and the association adopted the following preamble and resolutions:

"WHEREAS, Good nursing is of paramount importance to the comfort of the sick and the restoration of their health; and,

"WHEREAS, The subject is one which strongly addresses itself to the common sense and kindly sympathy of every intelligent member of society; therefore,

"*Resolved*, That this association, fully recognizing the importance of the subject, respectfully recommend the establishment at every county town in our States and Territories, of schools or societies for the efficient training of nurses, male and female, by lectures and practical instruction, to be given by competent medical men, members, if possible, of county societies, either gratuitously or at such reasonable rates as shall not debar the poor from availing themselves of their benefit."

This action of the association, prompted by Dr. Gross, has attracted the attention and received the approval of several of the more influential medical journals, and is of sufficient importance to engage the attention of the profession generally. In several of our largest cities there are already regular training schools for nurses, in connection with permanent hospitals, in which all the advantages are afforded for making accomplished and reliable nurses. But the benefits of such organized and thorough training schools, etc., in the nature of things, must be limited to the larger cities. To secure the better training of nurses for the towns and country districts, where they are even more necessary than in the cities, on account of the longer time between the visits of the physician, Dr. Gross has published an article in the *Medical News* of September 15th, from which we extract as follows:

"To educate nurses for the rural districts and villages, all that is necessary is to establish a central office or bureau at every county town in each State and Territory, and to place it under the charge of its medical society, which should elect two, or at most three of its members, to give the necessary instruction.

"Where no county society exists, the same object may be attained by the banding together of any two or three physicians in the place. Notice of the time and place of meeting should of course be given in the public prints, and also by card. A small matriculation fee should be charged, and also, where possible, a small fee for each of the instructors, to assist in defraying expenses. The teaching should be as practical as possible—essentially practical—each pupil being obliged to perform her work in the presence of her instructor, not once or twice, but again and again. There should be frequent examinations, and at the final one a certificate of competency should be awarded to the successful candidates.

"If the plan suggested be faithfully carried out, as I confidently believe it may be, either as here presented or with such modifications, changes, or alterations as circumstances may render necessary, it cannot fail to be instrumental in saving many lives, in preventing much suffering, in inspiring hope in the sick, and in imparting confidence to the professional attendant. If this plan succeed, I shall feel that I have accomplished the greatest work of my life."

HOW TO FALL ASLEEP.—I had often noticed that when engaged in deep thought, particularly at night, there seemed to be something like a compression of the eyelids, the upper ones especially, and the eyes themselves were apparently turned upward, as if looking in that direction. This invariably occurred, and the moment that, by an effort, I arrested the course of thought and freed the mind from the subject with which it was engaged, the eyes assumed their normal position, and the compression of the eyelids ceased. Now it occurred to me one night that I would not allow the eyes to turn upward, but keep them bent determinedly in the opposite position, as if looking down; and having done so for some time, I found that the mind did not revert to the thoughts with which it had been occupied, and I soon fell asleep. I tried the plan again with the same result; and after an experience of two years, I can safely say that, unless when something especially annoying or worrying occurred, I have always been able to go to sleep very shortly after retiring to rest. There may occasionally be some difficulty in keeping the eyes in the position that I have described, but a determined effort to do so is all that is required, and I am certain that if kept in the down-looking position it will be found that composure and sleep will be the result. It may be said that as the continued effort to keep the eyeballs in a certain position so diverts the attention as to free the mind from the disagreeable subject with which it has been engaged, sleep will follow as a natural consequence. It is not improbable that this is to some extent correct; and if so, it is well that by means so simple and so easily adopted, such a desirable result can be secured. But I think this is not the only nor the principal reason. The position in which the eyes should be kept is the natural one; they are at ease in it, and when there is no compression of the lids or knitting of the brows, the muscles connected with and surrounding the eyes are relaxed. This condition is much more favorable for sleep than for mental activity or deep thought.—*Chambers' Journal.*

THE TEETH.—Dr. Franzius finds that the tooth most often affected by decay is the third molar, such cases forming one-half of the total number. The teeth begin to decay in a certain successive order, the lower third molar being first attacked, then the upper, then the lower fourth molar, and so on, the incisors and the canine teeth of the lower jaw being the last reached. The upper teeth are more durable than the lower, in the proportion of three to two. The right teeth show a greater vitality than the left. The durability of teeth is less in light persons than in dark, and less in tall than in short persons. These results were obtained by an examination of 650 Russian soldiers, of whom 258 had unsound teeth.

MIDDAY NAP.—To a person of weak organization a little sleep in the middle of the day is beneficial. If taken after dinner it should not follow the meal immediately. It were better to adopt a late dinner hour—say three o'clock—and take the nap before eating. A debilitated nervous system will generally be benefited by such a practice.

NEURALGIA TREATED BY THE TUNING FORK.—Dr. Rasori applies the tuning fork, while vibrating, over the course of the painful nerve. The sitting usually lasts about half an hour, and the patient is generally relieved without further treatment. He records his method in the *Cinn. Lan. and Clin.*

THE BREATH.—A man breathes about twenty times in a minute, or 1,200 times in an hour. He breathes about eighteen pints of air in a minute, or upwards of seven hogshead a day.

MINING AND SCIENTIFIC PRESS.

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SAN FRANCISCO:

Saturday Morning, Dec. 22, 1883.

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Passing Events.

Although it seems somewhat early for the PRESS to wish its patrons a "Merry Christmas," the holiday will be past before it greets them again. Therefore we extend the "compliments of the season" on this occasion, and hope that the year has been as good to them in prosperity as it has to the PRESS.

The gathering of the clouds and the cessation of the frosts show the much needed rains will probably soon spread over the State.

There is little of an important nature concerning the mining industry other than we have summarized elsewhere in these columns. Active prospecting in the deep mines of Nevada continues, but honanzas still seem coy. The Coeur d'Alene mines are ice-locked, and will be for months to come; but in the spring the mountains in that part of Idaho will be overrun with prospectors.

COPPER.—The latest Liverpool quotations for copper are: Ore of 25%, 11s. 3d. to 11s. 6d., and Chili regulus, 11s. 9d. to 16s. per unit. Prices have fallen there somewhat, and dullness in trade seems to keep down every chance for an advance. Arrivals for the United States have been much less, and James Lewis & Son's report states that the shipments from here will be on a much reduced scale for some time to come. The consumption in England and France and export from England to December 1st, is about 8,500 tons now more than last year. Last month 2,700 tons came from Chili, and 3,936 tons from other countries. The total visible supply is 49,164 tons fine. The total arrivals of copper from January 1st to December 1st, inclusive, of pyrites, equals 84,718 tons fine. Chili exports for 1883 aggregate 43,376 tons fine.

Title to Mining Ground.

It has often been urged as a point against the mining industry that titles were generally unsettled; that when a man bought a mine he very often bought a law suit that would cost more than the mine would produce; that even after years of peaceable possession, some claim would be sprung if the mine proved rich. While this charge has not been wholly true, it is not without some foundation. It has been due, however, largely to the fact that the mines have been mainly in new regions where property lines were not accurately drawn and changes liable to occur. This feature is rapidly disappearing, however, and the government is more careful in granting and maintaining titles.

There was formerly a certain liberality prevailing in the Interior Department in reopening cases after they had been decided, but of late years a more conservative rule has been adopted in such matters. The Supreme Court, as well as the Circuit Courts of the United States, has laid down principles and requirements as conditions precedent to granting a device to set aside patents issued by the Land Department, which have been combined as an expression of views by the courts to the effect that the officers and departments of the United States government should not, without very good and sufficient reasons, institute proceedings to set aside a patent.

A case in point has just occurred, but the applicants have been very promptly "snubbed" by the Secretary of the Interior. It was one of those too frequent efforts to disturb the possession of the property which had been held by the original locator and his assigns for a number of years.

The patent to the property referred to was issued in the early part of 1879. Before a patent was issued a hearing was had, at the instance of citizens of Leadville, to determine the character of the land involved, it having been alleged to be non-mineral. Testimony was taken, and full opportunity was afforded to present all the facts pro and con involved in the application for location of the claim under the placer mining law, before the local office in Leadville, and to be heard by the General Land Office and the Secretary of the Interior. Parties claiming interests adverse to the claimants had an opportunity to file an adverse claim, and have their rights determined in court. The Commissioner, on the evidence so taken at that time, decided that the application should be allowed, giving at length his reasons for this conclusion; and, on the appeal of the case to the Secretary, the decision of the Commissioner was affirmed. Here was a deliberate adjudication by the Secretary of the Interior after a most careful and thorough investigation of the facts and the law in the case.

But after all this an attorney for certain citizens of Leadville asked permission to bring suit in the name of the U. S. to vacate the placer mining patents. The Commissioner of the Land Office referred the matter to the Secretary of the Interior, and both of them agreed there was no justification for the step. The Secretary says these people now set up substantially the same circumstances and allegations, both of law and fact, which were considered before the issuing of the patent, and seem to think there never is a time when litigation should end, and vested rights be settled beyond recall.

The following conclusions of the Secretary of the Interior will be heartily indorsed by the mining community: "If I were convinced that the patent to Starr and others was issued upon false and fraudulent evidence, so introduced, without opportunity for proper examination or rebuttal, as to necessarily affect the judgment of the officers of the department, I would feel it my duty, unless innocent purchasers had acquired possession of the property, to request the Attorney-General to institute the appropriate proceedings; but mere general allegations of fraud and misrepresentation will not suffice, and to deliberately decide, in effect, in the absence of such proof of fraud, that my predecessor, and the officers under him, reached an erroneous conclusion, is to invite not only want of respect for the adjudications of this office and the dependent patents, but endless litigation. It is obvious that if such a course were to be adopted, titles in the western country would be of little value, and the growth of communities upon the public lands would be retarded or stopped altogether."

Humid Metallurgy of Copper.

Every wet method of working copper consists of two principal operations: First, the separation of the copper by solution from the other ingredients of the ore or mixture; second, the separation of the copper in the solution from any other substance held in solution, by precipitating it as metal, as oxide, or otherwise. All wet methods are grouped into two principal classes: First, those in which the fresh solvent has to be used for the extraction of copper from each successive change; second, those in which the solvent is renewed or regulated in one of the later stages of the operation. Local conditions at any given locality, such as cost of fuel, etc., as well as character of the ore and its contents, must determine whether a dry or wet method should be selected. In any case the presence of a considerable quantity of lime, magnesia, or other constituents in the ore, which, by consuming the solvent, occasions its waste, would prevent success with wet processes.

Mr. James Douglas, Jr., a gentleman of much experience in this line, states that humid methods are adopted for extracting copper from its ores.

1. When the quantity of copper present is too small to admit of the application of a furnace method. The reagents consumed in dissolving copper from its associated minerals are generally in proportion to the absolute quantity of copper present, and consequently when the copper contents are low, the quantity and cost of the necessary solvents are proportionately reduced in case the non-cupriferous ingredients are inert and unacted on, otherwise the fuel, which is the principal reagent in all smelting methods, has to dispose of and alter the constituents of not only the copper but likewise the gangue.

2. When the ore contains injurious elements which cannot be eliminated in the smelting furnace, as for instance, arsenic and antimony.

3. When the copper is associated with other metals, economically valuable, which, if all were smelted together, would pass into valueless combination. For instance, the pyriton ores of Spain, after their sulphur has been roasted off, might be smelted, but by so doing the silver would enter the copper and be lost, and the iron would enter the slag and become valueless.

Fluxes in Lead Smelting.

The fluxes most frequently used in working lead-bearing ores are quartz, sandstone, clay, slate and other highly silicious rocks to supply any deficiency of silica that might be required to saturate the basic gangue in an ore; hematite, magnetite, limonite and specular iron ore, and the various manganese ores, if iron is lacking in an ore; limestone, dolomite and calcareous shale, if calux oxide is not in sufficient quantity in ore to form a slag of the type desired, to which may be added, says Mr. Hahn, slag or metallic iron, if we follow Webster's definition of flux, as "any substance or mixture used to promote the fusion of metals or minerals."

The action of slag is, however, generally more of a mechanical than of a chemical nature. If a coarse-sized smelting mixture is to be worked, an addition of slag to promote its fusion is entirely superfluous, and would only increase the cost of smelting; but if the charge is very fine, or if much zinc is present in it, slag will very materially promote its fusibility. Fluxes should be as free as possible from impurities to insure success in smelting. Thus a bituminous or silicious limestone would not be exactly the correct flux to select if we wanted lime for ore. As carbonic acid does not take any part in the composition of a slag, burnt lime would theoretically be the best; but as it rapidly attracts carbonic acid and water, thereby reducing its money value, and as it presents mechanical difficulties in the furnace, its application has never become general. It was at one time extensively used at some smelting works in Leadville. The presence of extraneous minerals in quantity of course increases the bulk of fluxes at an enormous rate, while the ore may become the smallest part of the smelting mixture. In this case the percentage of lead in the charge will arrive at a point where lead smelting is no longer profitable. Such cases have occurred in Southern Arizona, where had fuel and poor fluxes have ruined the lead smelter.

Scorification.*

In this method the litharge is made from lead during the operation. Scorification is the surest and simplest method of all. It is well adapted to rich ore but not to that which is poor, on account of the smallness of the quantity treated, or the time and fuel consumed. However, ores containing nickel, tellurium or tin, are better scorified, and buttons containing tin or nickel cannot be cupelled until scorified. Ores are scorified with an addition of granulated lead, and generally borax.

Granulated lead, like litharge, contains silver, and must be assayed. Take lead, 2 ounces or 60 grammes; glass, 60 grains or 4 grammes. Mix in a scorifier. Place in the heated muffle and close the door until the lead is melted, then open the door and maintain a moderate red heat, keeping the lead fused. When the lead is covered by the slag, remove from the muffle and pour into the assay mould. Return the scorifier to the muffle, and as soon as the assay is cool enough to separate the slag, return the lead to the scorifier, and so on until the lead is of suitable size for the cupel; weigh the resulting lead, and note its weight and that of the lead used, in the assay book.

Ordinary ores require from 8 to 12 parts of lead. Galena, or silver glance, 2 parts. Those containing much iron, zinc or tin, or of which the gangue is lime, require more lead; sometimes as much as 32 parts to one of ore. Tellurium may require 100 parts. A small quantity of horax is beneficial unless the gangue is quartz. With an unfamiliar ore it is best to make several assays, each with a different quantity of lead. If that one in which the greatest quantity of lead was used gives the highest result, another should be made with yet more lead, and so on until two assays agree. The following is a general formula for ordinary ores: Ore, 60 grains or 4 grammes; lead, 1½ ounces or 48 grammes; and a little dried borax, unless the gangue is quartzose.

Mix one-half of the lead with the ore and horax in the scorifier. Cover with the remaining lead. Place in the darkly red hot muffle. Close the door and increase the heat very gradually until the lead is thoroughly melted. [Some writers advise the rapid heating of the assay; with some ores this may do, but it would seem that it must always be dangerous, and with the ore of the Silver King mine, in Arizona, it caused sputtering.] Open the door and moderate the heat. The ore will be seen floating upon the lead. It soon takes the form of a ring, leaving the lead exposed. This is called the "bull's eye." If the bull's eye does not appear, the assay will fail. This is sometimes caused by the ore not being finely ground. When the bull's eye appears, maintain a cupelling heat by managing the damper and the door of the ash-pit. When the bull's eye is covered by the melted slag, add a couple of lumps of borax, by means of the cupel tongs; close the door, and give a higher heat for about five minutes. Meanwhile, heat to redness the suitably bent end of a thick piece of iron wire, then with it stir the contents of the scorifier. If any pasty lumps be felt, add a little more horax and close the door. The stirring must not be prolonged, especially with arsenical ores, or the wire will melt away, and the iron will form a crust on the assay. When the slag is perfectly fluid, the assay may be poured. The scorifier should be returned to the muffle (unless it is much corroded, when a new one must be taken), because the button may be too large, and must then be re-scorified. There is less loss of silver in scorifying the lead than in cupelling it; therefore the more the weight is diminished, within reasonable limits, the better. The button is cleaned and prepared for cupellation as in the crucible assay. The slag should be glassy; the color depends on the kind of ore. The lead button must be soft.

When very sulphurous ores are assayed, it is best to omit the horax entirely until the bull's eye is covered. When 32 parts of lead must be used, only 30 grains of ore, or 2 grammes, can be treated in a 2-inch scorifier. The scorifiers are handled by means of the scorifier tongs, and may be used until too much corroded, though the same rules apply to these as to crucibles in regard to re-use. As a scorifier may occasionally be pierced by the litharge formed, it is well to have an extra bottom in the muffle. Such a bottom may be bought, or made by cutting another muffle. The muffle bottom, extra or not, should be protected by a thin layer of bone ashes, which will absorb the spillings in case of accident, and may be scraped out. The scorifiers may be in a measure protected by rubbing the inside with reddle. Scorification furnishes a convenient means of purifying as well as lessening the weight of a button got in the crucible. By this means any substance, except the noble metal, may be removed from lead.

*This extract is from a simple practical work on "Assaying," by Chas H. Aaron, now being issued and for sale by Dewey & Co., S. F. Price $1.

AT the recent annual meeting of the Kentuck Mining Company, the following named gentlemen were elected Trustees: Wales L. Palmer, President; H. C. Swain, H. H. Noble, Wm. Hardy and J. W. Pew, Secretary. The working of the mine is leased to C. C. Stevenson. Eight dividends of $3,000 each have been paid this year, and there is a reasonable prospect of several more of the same kind.

The Bower-Barff Process—No. 3.

These magnetic-oxide processes not only protect from rust, but the coating is of such a beautiful color as to render articles ready for the market as soon as they are out of the furnace and cooled. One remarkable feature of them is that there is no more cost (except in the labor of handling them) in treating 2,240 articles, each weighing a pound, than there is in coating a tube of metal weighing a ton; and so penetrating is the process that no matter how intricate the pattern may be, every crevice—which it would be almost impossible to get at with a paint-brush—is as effectively coated as the plainest surfaces, as will be observed by examining the specimens exhibited. For art purposes the French gray color, with shades approaching to black, might not always be suitable; but if it should be necessary to use paint on the iron so coated, there is absolute certainty that it will remain on in the same way as it does on wood or stone, and thus iron may be used for constructive work in a thousand directions in which it has not up to the present time been possible on account of its liability to rust, no matter what the coating used to protect it has been.

Engineers and Manufacturere

Appear far more ready to apply the processes here and on the Continent of Europe than up to the present time they have been in England. Perhaps the reason has been that, so far as Professor Barff's process is concerned, it has only just been shown how large masses can be dealt with—namely, by the use of the Bower furnace. I can show that, for the treatment of underground pipes, wrought-iron sleepers, roofing and the like, the process can be readily applied, and at a cost much less than that of galvanizing, and they will at the same time be infinitely more durable; while for ornamental cast and wrought-iron it is scarcely possible to imagine anything more artistic in color than some of the articles after they have been treated. For ordinary hollow-ware for kitchen use, whether of cast or wrought-iron, this process is admirably adapted, and though I have been told that the gray or black color will probably be objectionable, yet I imagine, if it can be shown, as can be done, that the magnetic oxide is more durable, more easily cleaned and much cheaper than even the common tinted article, a market will soon be created. Anyhow, the new combined processes are so far developed, and they have been so thoroughly examined by scientific and practical men both here and in Europe (whose testimony to the value and efficacy of them is voluminous), that they have passed from the region of theoretical investigation into that of

Practical Application,

And means have been taken for establishing works at different centers in Europe, as will also be done here, for the purpose of coating iron and steel as a trade operation. One firm alone in Scotland, Messrs. Walter Macfarlane & Co., have adopted the process, and their output of ornamental castings per day exceeds 100 tons. It is intended to apply the process to cast-iron gas and water pipes, and as the former have comparatively no pressure to bear, they may be made much lighter than they now are, if rendered incorrodible; while for water, it will be a great advantage to have both the main and service pipes rendered safe from rust, which not only discolors the water, but forms the nucleus of very troublesome deposits. There is no reason now why wrought-iron or mild-steel pipes should not be used for the same purposes, especially for the interior towns of distant countries, where the first cost of the pipes is but small as compared with the cost of carriage.

It will naturally be asked, what is

The Cost of the Process?

I cannot do better than answer the question by quoting from the report of Professor Flamache, the engineer-in-chief of the State railways in Belgium, who was sent over specially to England to report on the process by the Public Works Department of that country. His estimate of cost, after a very careful examination and testing of the process was 7½ francs per 1,000 kg., or nearly $2 per ton, at, of course, the Belgian rate of expenses. He also gives the cost of coating a certain extent of surface, but this I consider to be completely valueless, as, for example, I have had a furnace full of 56-pound weights, and another time I have had it full of gas-governor tops, the surface in the latter case being perhaps one hundred times more in extent than in the former, while the actual cost of oxidizing would be the same in both cases. He also says that this cost may be reduced, as instead of one workman attending to one furnace he can attend to three or four; also by a better system of taking the articles out than existed in the experimental furnace that he saw.

Sir Joseph Whitworth, feeling much interest in Professor Barff's process, sent to him some steel to be oxidized, so that he might ascertain whether it did or did not lose in strength by the operation, and the result of Sir Joseph's

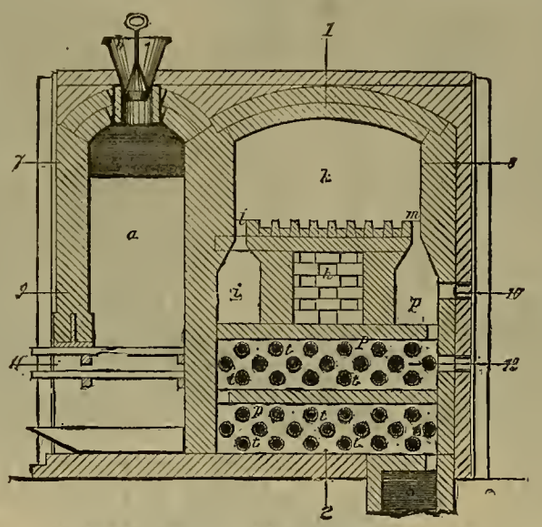


Fig. 5.—TRANSVERSE VERTICAL SECTION, BOWER-BARFF FURNACE, ALONG LINE 5-6 IN FIG. 3.

testing was that there had been no alteration whatever. Theoretically, one would rather expect that iron and steel would be somewhat toughened, as the tendency of the process is to anneal, and would, no doubt, if continued long enough, render some classes of cast iron malleable. A very thin article, if excessively coated, might probably be weakened, due to the fact that the coat of magnetic oxide would form an appreciable percentage of the bulk of the article; but this, of course, is a very extreme case, and one which is not likely ever to occur in practice.

The development of these processes has been a long and tedious business, and one requiring much faith and patience in the midst of most disheartening failures for months together; but to gentlemen connected with the iron and steel industries, and who know well that results are only obtained by patient and well-directed toil, I need not dwell on this, as almost every man who has had to reduce theory to practice has had abundant experience of the same kind.

JOHN SHIPTON, an old colored pioneer of the Comstock, died at Virginia this week. He was well known to all old residents.

THE Vignite Powder Company has declared its first dividend this week.

Blasting in Mines—No. 18.

Safety-Nitro Powder.

The safety-nitro powder is one of the more modern explosives, having only been introduced in 1881; but since that time it has been largely put into use so that the capacity of manufacture of the company has been twice enlarged. Very extensive works have been erected on the bay shore by the safety-nitro company, who make, in addition to the explosives, acids as well. Three grades of safety-nitro powder are made, known respectively as Nos. 1, 2 and 3. The strongest made is the No. 1, and it is used to deal with hard rock, and where great force is to be exerted on a small surface. If the blasting is to be done in a softer material, and a large mass to be handled, No. 2 is used. Still another mode of action is often desirable—a heaving action. With the No. 3 small holes are required, and there is very little or no smoke. The No. 3 is used for such work as black powder is intended to do.

Although the company know very well that experienced blasters have their own rules, they suggest certain directions for the use of safety-nitro powder, as follows: Use the quantity as with the high explosives of equal grade, until

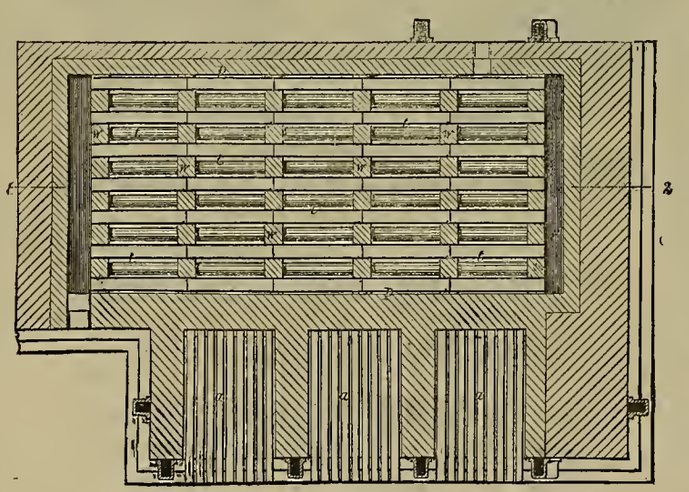


Fig. 6.—HORIZONTAL SECTION, BOWER-BARFF FURNACE, ALONG LINE 11-12 IN FIGS. 1, 2 AND 5

satisfied less will do its work. In loading use a wooden tamping bar and ram the charge well home, so that the powder will be well packed in the bottom of the hole. In tamping fill up the hole with sand, clay or earth, and tamp well so as to entirely exclude the air; this will insure an effective blast. To explode the cartridge insert the fuse into a tripple or sextuple cap, taking care that it is well in contact with the fulminate in the bottom of the cap, then nip the cap tightly at the top, around the fuse—insert the cap with fuse attached into the cartridge and let it down into the blasting hole. In dry holes, especially in close drifts or tunnels, it must be remembered that paper smoke is unpleasant, and therefore the miner should slit up the paper and drop only the powder into the hole; then pack it well in the bottom with a wooden tamping rod. In wet holes the paper wrapper must be retained, as it is impossible to load properly without it.

To avoid miss-shots only the best of fuse and caps should be used; they are the cheapest. One miss-shot will more than pay for a box of caps. Care should be taken that the fuse is cut clean and square before inserting it into the cap, and that the cap is free from sawdust in the inside. In wet holes, be sure and grease well the joints between the caps and fuse, so as to exclude moisture or water. In cases of doubt put down an extra fuse and cap and light both fuses. It makes the matter sure, and the extra cost is trifling. When practicable use a priming cartridge—that is, pack the charge in the hole; then place the cap in the last cartridge, tie it fast, and lower the priming cartridge upon the main charge; then fill the hole and explode. Only tripple-force caps are used with these powders.

To light a fuse easily and quickly—split the end, and insert a very little of No. 1 or No. 2. This will hold the fuse-powder in place, and enable you to light it with ease and certainty. In tamping powder, always use a wooden rammer. Never use an iron or steel bar with any explosive. Handle caps carefully, and never keep or store them in the same place with powder. Don't get nitro-glycerine on your fingers. Always thaw frozen powder by gentle heat. Never roast cartridges. Not only is it dangerous, but it decomposes and injures the powder. Black powder will develop a marked increase of force if fired with a primer of any of these high explosives. The lower grades will prove more effectual if fired with a primer of No. 1. Always fill the hole with something when using these powders. Dry sand makes the best tamping, but anything which will exclude air will answer.

The company speaks as follows of springing in its circular: The No. 1 and No. 2 are admirably adapted for springing. The enormous strength of our No. 1 fits it specially for this work. It springs a large "pot hole," and springs it deep. As a rule, No. 1 for springing is best, as the most economical. But, in soft or medium ground, many experienced blasters use No. 2 with excellent results. In springing holes, a small hole is converted into a large one, and thereby much labor is saved. Every expert at blasting has his own method of doing this work. Nevertheless, we venture to give the way which has given us the best results: Pack a small quantity of powder firmly in the bottom of the hole. Now, lower upon it a small primer, being sure that the primer is well in contact with the charge. Pour in a handful of dry sand, to exclude the air; then explode. By this means you have enlarged the hole at its very bottom, and can now get a charge of powder well down, where it will do the most good.

As these powders are safe to pack, even in the most ragged hole, you can fill this enlarged space with powder, either for further springing or for throwing, as you desire. It is wonderful how much better execution powder will do when packed in this way in the very bottom of the hole.

Among the claims made for these powders, aside from their strength and adaptation to various classes of work are: freedom from leakage, safety in use, lightness of smoke, plastic character, and great downward force. The company state positively that some of their powders contain chlorate of potash, but that they are made of the best materials. They make a strong black powder known as E. S. E., which is furnished in bulk or in cartridges. The safety-nitro powder has been extensively used in mining and railroad work on this coast, since its introduction, and many testimonials on its efficiency have been given the company.

MR. ELLIS HARRIS, whose business consists of shipping ore from Leadville to Utah smelters, and who has been in this city for the past ten days, left yesterday via the D. and R. G. for Colorado. He ships on an average from the Fryer Hill mines about ten cars of ore a day, amounting to about one million pounds a week. The ore is shipped to the Horn Silver, Mingo, Germania and Morgan smelters, and Mr. Harris says the reason for shipping the ores such a great distance is the fact that there is a better market in Utah for the class of ores shipped than in Colorado.—*Salt Lake Tribune.*

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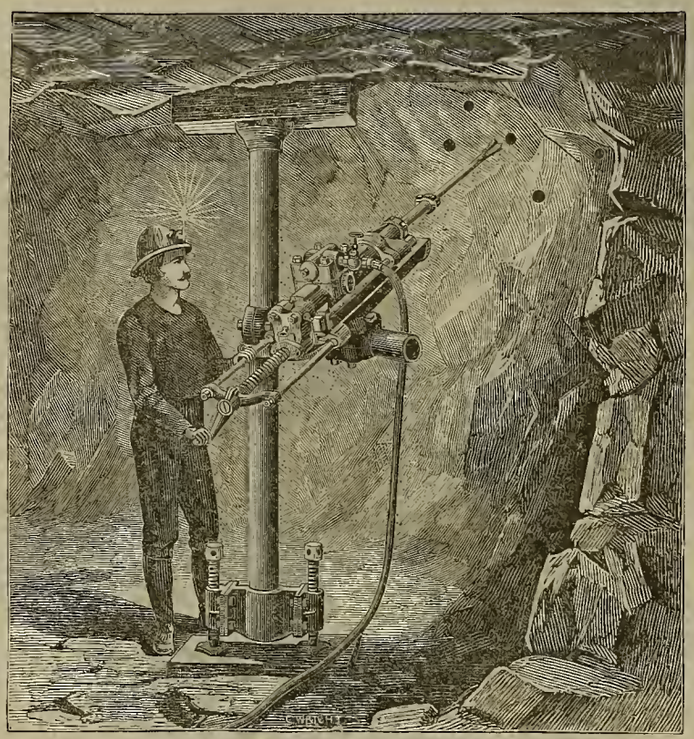
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Ingersoll, D2 3", beat National 3½"	.505	" "
Ingersoll, E 3½", beat Rand 3½"	.560	" "
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National beat Rand	.139	" "

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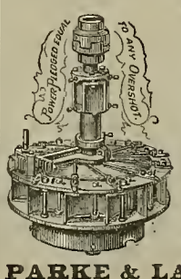
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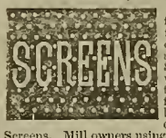
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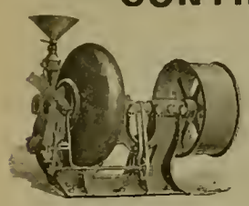
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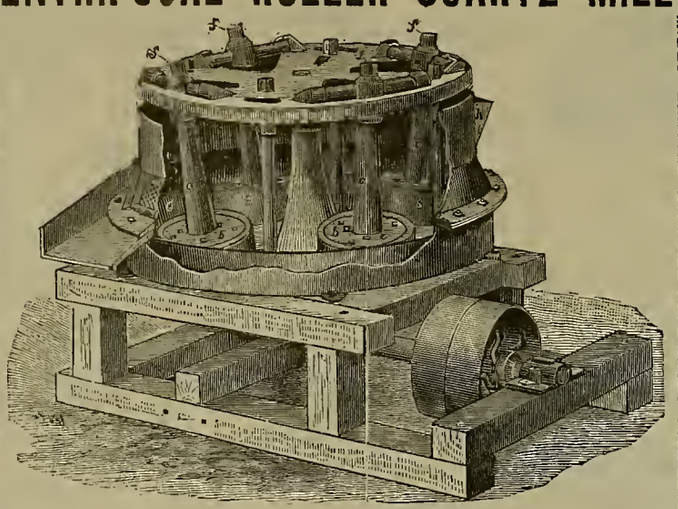
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MILLS ERECTED WITH ALL APPLIANCES COMPLETE.

After running one of these mills on the Whidden mine, in El Dorado County, over four months, and thoroughly testing its capacity and durability, I am prepared to offer it to the mining public, and claim for it the following advantages over the drop-stamp mill:

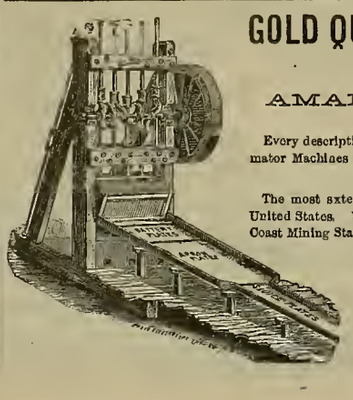
1. The cost of same capacity is not more than one-half that of stamps.
2. Freight to mine one-fourth that of stamps.
3. Cost of erection at mine one-tenth that of stamps.
4. It runs with one-third the power per ton of ore crushed.
5. The wear is less than that of stamps.
6. The wearing parts are easily duplicated.
7. It has a much better discharge, and leaves the pulp in better condition for concentrating.
8. It is a better Amalgamator, saving fully nine-tenths of the gold in the mill; the balance can be saved on plates in the usual manner.
9. It is continually crushing; not like the stamp, using power to suspend it in air ninety-nine one-hundredths of the time and the balance making a thundering noise, and accomplishing *comparatively* small results. It is as far in advance of the stamp mill as the present method of making flour with improved rolls is over the Indian's mode of crushing corn in a stone mortar.

PATTEN'S CONCENTRATOR.

This machine requires less power, less care or attention, and is less liable to get out of repair than any concentrator now in use; all of which any practical miner will comprehend when seeing it in operation.

The wear and tear is nominal, and the construction so simple that any miner can put it up and run it, and the low price brings it within the reach of all mill men, as it will save enough to pay for itself in any mill in a very short time. One machine will concentrate the tailings from a five-stamp battery.

SHINGLE MACHINES AND SAWMILL MACHINERY OF EVERY DESCRIPTION.



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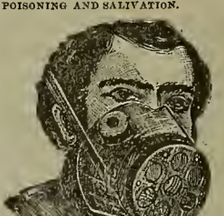
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PREVENTS LEAD POISONING AND SALIVATION.



Invaluable to those engaged in dry crushing quartz mills, quicksilver mines, white lead corroding, feeding thrashing machines and all occupations where the surrounding atmosphere is filled with dust, obnoxious smells or poisonous vapors. The Respirators are sold subject to approval after trial, and, if not satisfactory, the price will be refunded. Price, $3 each, or $30 per dozen

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Notices of Recent Patents.

Among the patents recently obtained through DEWEY & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

BASIN AND WATER-CLOSET VALVE.—Holland Smith, S. F. No. 289,437. Dated Dec. 11, 1883. The water-supply pipe and the waste pipe are brought near enough together at some point below the howl to allow the valves which control them to he operated hy a single shaft, to which they are connected. An arm or crank is connected with the shaft and a treadle attacbed. When the washbowl is to he used the foot is placed upon the treadle and all the valves opened. The plug heing on the discharge opening of the hasin the cocks may be opened and water drawn for use. After use the plug may he withdrawn and the contents allowed to escape through tbe wasté pipe. The treadle heing released, a weight or spring will revolve the shaft and close the valves so no water can run; neither cau there be any escape of sewer or other noxious gases from the waste pipe. The valve acts on a perfect seal; the waste valves are closed as soon as the treadle is released, so if tbe cocks should he carelessly left open there would be no flooding, as the supply would be cut off instantly when the person released the treadle to go away.

SEWER GATE.—Samuel Johnson, S. F. No. 289,108. Nov. 27, 1883. Tbis is an automatic or self-acting sewer gate. The automatic gate is suspended on a horizontal shaft or axis, so that a greater area of surface is presented above the axis, said gate having a float on its lower and outer side. When left to itself the gate will close against a frame, and the flow of water down the sewer will press it closely, so that none can pass, until it has risen above the rod or shaft near the top of the gate, when the superior pressure upon this part, produced by the greater area, will lift the gate, and cause it to turn about its shaft and open. To prevent the rush of water from closing the gate again, on the hack or lower side is a large float, formed so when the gate is first tilted and opened the float will cause it to rise and lie on the surface of the water, wbich flows heneath the float. When the water bas nearly passed out tbe augle will he such that the water will again act upon the front of the gate to close it, and the operation will he repeated.

SHOE FOR GRAIN SEPARATORS.—Arthur H. Johnsou, Woodland, Yolo Co. No. 289,915. Dated Dec. 11, 1883. This shoe is made of light pieces set at right augles to each other, the ends being on top of the sides iu order to properly inclose the riddle which is laid on the shoe. Attached to the sides of tbe shoe are flexible strips (preferably leather) having flexihle tongues hy which the shoe can he adjusted from the outside to any inclination, or to raise or lower any coruer, or otberwise change its position, according to circumstances. A combiuation of movements is perfected—namely, a side motion of the shoe and an end motion of the grain board. Tbis is heneficial in its effects. It gives a hetter agitation to the grain than if both moved in the same directiou, and thus allows the wind to clean it up thoroughly.

MOTOR.—Camille de Mezerville, Santa Clara. No. 289,889. Dated Dec. 11, 1883. This is a motor of that class in which tbe power of a weight or weights is transmitted through a series of gears to the machine or mechanism to he operated upon. The invention consists in the means for throwing the driving gears on and out of engagement; in the means for operating the winding drum to elevate the weigbts, and in the meaus for causing the hoisting ropes to lay up even on the drums. Tbe object is to provide a simple and practical motor for driving small macbines, such as sew ing machines and the like.

SAW TOOTH.—Eugene Smith, S. F. No. 289,576. Dated Dec. 4, 1883. This is au improvement in insertihle teeth for saws. It consists of a peculiarly sbaped tooth, and its combination with and iusertion into the saw plate in such a manner as to bring the strain wheu at work in the direction of the length of the tooth, to provide a strong support for the teeth and a perfect clearance while enahling the teeth to he placed morc closely together, and to allow the teeth to be sharpened until worn out without altering their angle.

DESIGN FOR BRACELET.—Robert H. Ahn, S. F. No. 14,438. Dated Nov. 27, 1883. Heretofore bracelets have heen formed of rounded wires bent into the proper oval or circular shape to iuclose the wrist, the ends extending past each other a short distance wheu in place, and having ornameutal eud or other devices, the elasticity of the hoops retaining them in place on the arm. This design consists of a hoop or bracelet having its outer periphery concaved so as to show one or more grooves or channels.

IF YOU want a lubricant that will run any thing cool write CHARLES J. WOODBURY, GENERAL MANAGER LUBRICATING DEPARTMENT CONTINENTAL OIL AND TRANS. CO., for "Lubrice." It is the best compound-grease in the market. Shipped in 5, 10 and 25-pound cans, half barrels and barrels. Warranted to give satisfaction. Observe the numbers: No. 2 is soft for outside work; No 3 is medium soft; No. 4 is medium hard; No. 5 is very hard, where unusual lubrication is demanded. Send for Catalogue of Lubricating Oils

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ASSESSMENTS.

COMPANY.	LOCATION.	No.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Andes S M Co	Nevada	23	25	Nov 10	Dec 20	Jan 9	B Burris	309 Montgomery st
Baker Divide M Co	California	8	20	Dec 5	Jan 7	Jan 28	W G Hughes	330 Pine st
Boston Con M Co	California	5	25	Nov 21	Dec 24	Jan 14	F E Luty	330 Pine st
Bullion M Co	Nevada	28	20	Nov 16	Dec 18	Jan 7	J N Brazell	320 Montgomery st
Bodie Tunnel Co	California	3	15	Nov 1	Dec 7	Dec 27	C C Harvey	309 California st
Buena Vista Petroleum Co	California	31	25	Oct 30	Dec 5	Dec 27	L Kennann	220 Sansome st
Caledonia M Co	Dakota	14	10	Oct 21	Dec 13	Jan 11	W L Oliver	328 Montgomery st
Columbus Con M Co	Nevada	1	25	Nov 5	Dec 10	Jan 3	J M Buttington	309 California st
Day S M Co	Nevada	14	30	Dec 1	Jan 7	Feb 5	E M Hall	327 Pine st
Eastern Quicksilver M Co	California	2	10	Dec 7	Jan 15	Feb 4	F A Berlin	420 Montgomery st
El Dorado Con M Co	Nevada	1	05	Dec 4	Jan 7	Jan 23	J H Sayre	330 Pine st
Eureka Tunnel Co	Nevada	2	50	Nov 9	Dec 10	Jan 11	J Parly	Eureka Nevada
Golden Fleece G M Co	California	31	—	Dec 12	Jan 16	Feb 4	F Schirmeier	783 Folsom st
Gould and Curry S M Co	Nevada	46	50	Nov 7	Dec 12	Jan 3	A K Durbrow	309 Montgomery st
Gold Lead M Co	Nevada	4	5	Nov 9	Dec 17	Jan 8	J Bronzan	326 Montgomery st
Hale & Norcross M Co	Nevada	79	50	Nov 17	Dec 21	Jan 14	J F Lightner	309 Montgomery st
Independence M Co	Nevada	12	20	Dec 1	Jan 4	Jan 28	J W Pew	310 Pine st
Hingo M Co	California	1	30	Dec 18	Jan 23	Feb 16	J L Fields	330 Pine st
Loreto M and M Co	Mexico	5	50	Dec 5	Jan 7	Jan 24	H G Jones	327 Pine st
Massachusetts Con M Co	California	1	10	Dec 4	Jan 12	Jan 31	A C Hammond	Merchants Ex.
Mayflower Gravel M Co	California	21	10	Nov 26	Dec 27	Jan 15	J Morizio	328 Montgomery st
McElroy Gravel M Co	California	11	25	Oct 25	Nov 30	Dec 26	J T Fogarty	806 Montgomery st
Northern Belle	Nevada	1	50	Nov 30	Jan 1	Jan 28	W Willis	309 Montgomery st
Original Keystone M Co	Nevada	7	30	Nov 21	Dec 22	Jan 10	F E Luty	330 Pine st
Pinal Con M Co	Arizona	5	10	Dec 15	Jan 23	Feb 15	A Adler	309 Montgomery st
Savage M Co	Nevada	27	50	Nov 3	Dec 7	Dec 27	E B Holmes	309 Montgomery st
Wide Awake M Co	Arizona	17	20	Nov 17	Dec 28	Jan 28	C Hildebrandt	320 Sansome st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Argenta M Co	Nevada	E M Hall	327 Pine st	Annual	Jan 14
Gorilla M Co		A A Enquist	436 Montgomery st	Annual	Dec 26
Mountain M Co		B E Henrickson	213 Mission st	Annual	Jan 7

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Bulwer Con M Co	California	W Willis	309 Montgomery st	15	July 2
Idaho M Co	California			4.00	Dec 2
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	Nov 19
Mt Diablo M Co	Nevada	R W Heath	318 Pine st	25	Nov 26
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	Dec 12
Silver King M Co	Arizona	J Nash	315 California st	25	July 12

Mining Share Market.

The approach of the holidays has had an effect on the market to make it still duller than before. Ophir has attracted considerable attention as its annual election took plaee on Wednesday. This we refer to elsewhere. At Gold Hill it has been found necessary to lay off a considerable number of miners at the leading mines on account of the low stage of water in the Carson river. This temporarily affects the business men on the Comstock, but in no way directly influences the stock market. The water has been all taken out of the Alta and resuming of operations on the 2150 level, and brisk times may be looked for at the south end. In a few days the new hydraulic pump at the Chollar-Norcross-Savage shaft will start up, which will give new life and activity to all the middle Comstock mines. The south drift in the Union Con., on the 3100 level, is still in vein porphyry. The ore streaks eut in the winze lie to the east of the drift. It is found that the whole stratification, at a short distance south of the 3100 station, has changed its course and is now bearing toward the southeast. In order to find the ore streaks encountered in the winze, it would be necessary to crosseut to the east, but a connection with the main north drift being at this time of prime importance, the drift is being pushed directly south as rapidly as possible.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with tbe interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it tbeir own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $4 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will he called to this (as well as other notices, at times), by turning a leaf.

Bullion Shipments.

Alice, Dec. 11, $7,571; Hanauer, 11, $8,000; Stormont, 11, $1,880; Vienna, 1, $9,955; Horn Silver, 11, $18,000; Hanauer, 16, $5,600; Vienna, 12, $1,557; Ontario, 16, $3,989; Horn Silver, 16, $9,000; Vienna, 13, $1,635; Tintie, 13, $2,500; Ontario, 13, $6,097; Horn Silver, 13, $6,000; Ontario, 14, $3,943; Horn Silver, 14, $9,000; Hanauer, 14, $5,270; Alice, 15, $9,996; Hanauer, 15, $4,870; Eureka, 15, $19,000; Ontario, 15, $5,828; Horn Silver, 15, $12,000; Vienna, 16, $1,634; Ontario, 16, $4,128; Horn Silver, 16, $6,000; Navajo, 13, $8,309; North Belle Isle, 13, $2,015; Grand Prize, 13, $6,500; Paradise Valley, 10, $2,366; Alice, 8, $7,744; Lexington, 5, $11,000; Silver Bow, 8, $8,433; Dexter, 8, $2,305; Moulton, 7, $5,886.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

JARED C. HOAG—California.
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REMITTANCES to this office should be made by postal order or registered letter, when practicable. Cost of postal order, for $10 or less, 8 cents; for registered letter, in addition to regular postage (3 cts. per half ounce), 10 cts.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Nov. 27.		WEEK ENDING Dec. 5.		WEEK ENDING Dec. 12.		WEEK ENDING Dec. 19.	
Alpha	....	1.65	.70	.90	1.00	1.05	....	....
Alta	1.05	1.35	.75	1.05	.95	1.35	1.30	1.55
Andes	.40	.55	.20	.30	.20	.50	.45	.50
Albion	....	....	....	....	....	.10	....	....
Argenta	....	....	....	....	....	.05	....	.05
Atlas	....	....	....	....	....	....	....	....
Belcher	....	.80	.80	.90	.90	1.05	.85	.90
Belding	....	....	....	....	....	....	....	....
Best & Belcher	2.65	3.55	2.25	2.75	2.00	3.00	2.50	2.75
Bullion	.40	.65	.20	.25	....	.30	....	.45
Bechtel	....	....	....	....	....	....	....	....
Belle Isle	....	30	....	.30	....	.30	....	....
Bodie Con	.30	1 25	.75	.95	.75	.90	.75	.80
Benton	05	.15	.05	.15	15	.25	.20	.25
Bodie Tunnel	....	....	....	....	....	.35	....	....
Caledonia	....	....	....	.15	....	.15	....	....
California	....	.25	.15	.25	.15	.25	....	.10
Challenge	....	....	....	.15	....	....	....	....
Chollar	1.85	2.05	1.55	1.90	1 70	2.25	2 00	2.20
Confidence	1.10	1.60	.70	.90	.80	.85	....	1.00
Con. Imperial	....	....	....	....	....	.05	....	....
Con. Virginia	.35	.45	.25	.35	.30	.35	.25	.30
Crown Point	.80	1.00	60	.75	.90	1.10	....	.80
Day	....	.40	....	.30	....	....	....	.30
Elko Con	....	.20	....	.20	....	.10	....	.20
Eureka Con	3.50	4.10	2.95	3.45	2.75	3.50	3.00	3.25
Eureka Tunnel	....	....	....	....	....	.55	....	....
Exchequer	.30	.40	.20	.30	.30	.40	....	.30
Grand Prize	.25	.35	.20	.30	.25	.30	....	.25
Gould & Curry	1.10	1 50	.85	1 15	.80	1.80	1 50	1.65
Hale & Norcross	1.05	1 80	.70	1 10	.85	1.30	1.00	1.45
Holmes	.90	1.00	1.00	1.10	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	....	....	....	....	....	.03	....	....
Justice	.20	.25	.15	.25	.25	.35	.30	.35
Jackson	....	....	....	....	....	....	....	....
Kentuck	....	....	....	....	....	....	....	....
Martin White	....	....	....	....	....	....	....	....
Mono	.40	.50	....	.15	....	....	....	....
Mexican	2.20	2.80	1.70	2.30	1.90	2.50	....	.10
Mt. Diablo	....	3.25	2.60	3.10	2.75	.90	1.95	2.20
Mt. Potosi	....	....	....	....	....	....	....	2.40
Noonday	....	....	....	....	....	....	....	....
Northern Belle	....	2.00	.80	1.40	.15	.50	....	....
North Noonday	....	....	....	....	....	....	....	.20
Navajo	3.80	3.90	3.70	3.75	3.25	3 65	....	....
North Belle Isle	....	.50	....	....	....	....	3.45	3.55
Occidental	.70	1.20	....	.75	1.70	1.95	....	.45
Ophir	3.60	5.75	3.75	5	7.00	8.50	....	9.00
Overman	....	.20	....	.15	.20	.35	7.50	17.00
Oro	....	....	....	....	....	....	.20	.25
Potosi	.65	.75	.50	.80	.75	1.05	.90	.95
Pinal Con	....	....	....	....	....	....	....	....
Savage	.30	.70	.15	.70	.70	1.00	.80	.95
Seg. Belcher	....	....	....	....	....	1.25	....	....
Sierra Nevada	2.50	3.85	2.15	2.70	2.25	3.55	2 65	3.25
Silver Hill	....	....	....	....	....	....	....	....
Silver King	....	....	7.00	7 75	....	78	....	....
Scorpion	.40	.50	.35	.40	.35	.50	.35	.40
Tuscarora	....	....	....	....	....	....	....	....
Union Con	2 65	3.65	2.20	2.80	2.40	3.40	2.45	3.05
Utah	1.40	2.05	1.05	1.60	1.25	1.85	1 50	1.70
Ward	....	....	....	....	....	....	....	....
Wales	....	.25	.20	.30	.20	.25	....	....
Yellow Jacket	2.05	3.15	1.50	1.95	1.60	2.20	1.65	2.00
	....	....	....	....	....	....	....	....

Sales at San Francisco Stock Exchange

THURSDAY A. M., Dec. 20.

100	Alta	1.30@1.35	
100	Andes	.50@	
100	Bodie Con	.80@	
100	Benton Con	.25@	
150	B. & Belcher	.20@2.60	
160	Chollar	2.30	
200	Con. Virginia	.30@.35@	
500	Exchequer	.35@	
1850	Grand Prize	.20@.25@	
250	Gould & Curry	1.60	
300	Justice	.30@	
70	Mt. Diablo	1.70@1.80	
250	Navajo	2.05@3.40	
125	Ophir	4.90	
100	Potosi	.95@	
335	Sierra Nevada	2.80	
300	Savage	.90@	
100	Scorpion	.40@	
30	Utah	1.60	
235	Union Con	2.55@2.60	

AFTERNOON SESSION.

1000	Alta	1.35@1.40	
50	Alpha	1	
390	Best & B	2.75@2.80	
1470	Benton	.25@	
100	Bullion	.55@	
130	Belcher	.95@	
280	Chollar	2.45@2.50	
100	California	.15@	
60	Eureka Con	2.60	
510	Exchequer	.35@	
400	Gould & Curry	1.80	
150	Hale & Nor	1.85	
500	Justice	.30@.35@	
570	Mexican	2.25@2.30	
200	Northern Belle	.15@20@	
375	Navajo	3.40	
380	Savage	1	
265	Sierra Nevada	3 05	
400	Scorpion	.40@	
1620	Union	3@3.05	
60	Utah	1.85	

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions The pavilion has new varieties of performanees. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

ADDRESS all correspondence to the name of the paper or firm, as either of the publishers or editors connected with the office are quite likely to be absent at times.

Addresses. Business letters should be addressed and drafts made payable to DEWEY & Co.

SEEK

health and avoid sickness. Instead of feeling tired and worn out, instead of aches and pains, wouldn't you rather feel fresh and strong?

You can continue feeling miserable and good for nothing, and no one but yourself can find fault, but if you are tired of that kind of life, you can change it if you choose.

How? By getting one bottle of BROWN' IRON BITTERS, and taking it regularly according to directions.

Mansfield, Ohio, Nov. 26, 1881.

Gentlemen:—Ihave suffered with pain in my side and back, and great soreness on my breast, with shooting pains all through my body, attended with great weakness, depression of spirits, and loss of appetite. I have taken several different medicines, and was treated by prominent physicians for my liver, kidneys, and spleen, but I got no relief. I thought I would try Brown's Iron Bitters; I have now taken one bottle and a half and am about well—pain in side and back all gone—soreness all out of my breast, and I have a good appetite, and am gaining in strength and flesh. It can justly be called the *king of medicines*.

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BROWN'S IRON BITTERS is composed of Iron in soluble form; Cinchona the great tonic, together with other standard remedies, making a remarkable non-alcoholic tonic, which will cure Dyspepsia, Indigestion, Malaria, Weakness, and relieve all Lung and Kidney diseases.

NOTICE OF ASSESSMENT.

The Land Purchasers' Association.—Location of principal place of business, San Francisco, Cal.

NOTICE IS HEREBY GIVEN, that at a meeting of the Board of Directors, or Trustees, held on the 5th day December, 1883, an assessment of five dollars ($5.00) per share (being balance of 44th and part of 45th installments) was levied upon the capital stock of this corporation, payable immediately to the Secretary at the office of the Company, 318 Montgomery St., San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 7th day of January, 1884, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on TUESDAY, the 12th day of February, 1884, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors.

EDWARD P. GRAY, Secretary.

OFFICE—318 Montgomery St., San Francisco, Cal.

N. B.—This Assessment is to pay the taxes on the Association property for the current year.

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We have just received a new improved Rotary Job Printing press of approved style and make, which we will sell at a bargain or exchange on favorable terms for a Washington hand press. Size of chase inside 7x10 inches.

DEWEY & Co., publishers.

The Lemmon Herbarium.

This Herbarium has been removed from the Blake House to a permanent place at 1205 Franklin St., near Fourteenth St., Oakland, one square east of the Post Office, where plants of the Pacific Coast, including Arizona, may be determined on application, and instruction given in botany during the winter. Sets or single specimens of the rare and new ferns of the Pacific Coast for sale.

Business Offices and Sunny Rooms to Let.

We have some desirable rooms to let adjoining the offices of this paper, which will be rented on favorable terms. Stair entrance, No 252 Market St. Elevator, No 12 Front St. Parties wishing offices, etc., will do well to call and see them. DEWEY & CO.

Academy of Sciences.

A regular meeting of the Academy was held on Monday, President Davidson in the chair. J. G. Lemmon made some observations about new species of plants he had discovered in Arizona. Dr. Harkness also exhibited a large variety of vegetable galls.

The following were proposed for membership: Henry R. Taylor, S. M. Mouser, M. D.; J. Labadie, Secretary of the Mexican Legation; Carlos Mexia, Mexican Consul; Wm. F. Smith.

Professor Davidson gave a brief explanation of the method of determining by the micrometa, the difference of declination between the comet and any star. The Professor observed that a remarkable thing about the present comet—Pons-Brooks—is the rapidity of its movement and also of its development. He then referred to the ruddy glow in the western sky at evening and the eastern sky in the morning, which has been observed recently, adhering to his former statement, attributing it to smoke.

Dr. Harkness said he would like to have it explained how smoke separates the red from all the other rays of light, and how in the absence of all pervading fires, the whole continent could be enveloped in smoke. He said he rejected the volcanic theory, and he seemed disposed to insist upon that of aqueous vapor in the air. He said he had observed closely at morning and in the evening, and he had been unable to detect any smoke.

Professor Davidson replied that he was not called upon to explain why smoke separated the rays any more than he was to explain why the prism did. The two facts stood, whether they were explained or not. He had applied the test of the speetroscope, and, besides, it was well known to all scientists that, in flashing signals with the beliotrope, when the signal was given through a smoky atmosphere the light was always red, and when there was no smoke it was white. With regard to the doctor's statement that there was no smoke in the air, the Professor stated that he had recently been sending signals to distant points with the heliotrope, and that they had been greatly obstructed by the smoke in the air.

The committee to make nominations of officers for the ensuing year, reported the following: For President, George Davidson; first Vice-President, H. H. Harkness; second Vice President, H. Herrmann Behr; Corresponding Secretary, Samuel B. Christy; Recording Secretary, Charles G. Yale; Treasurer, Elisha Brooks; Librarian, Carlos Troyer; Director of the Museum, William G. Harford; Trustees—C. F. Crocker, R. W. Simpson, George E. Gray, Thomas P. Maddeu, Ralph C. Harrison, James M. McDonald, L. Gerstle. The following were elected Inspectors of Election: W. F. Meyers and Archibald Cooper; Judges, Alphens Bull, Jr., and Charles Wolcott Brooks.

San Francisco Metal Market.

WHOLESALE.

THURSDAY, Dec 20, 1883.

ANTIMONY—Per pound	14	@	15
IRON—American Pig, soft, ton	30 00	@	—
Scotch Pig, ton	24 00	@	28 50
American White Pig, ton	28 00	@	32 50
Oregon Pig, ton		@	—
Clipper Gap, Nos. 1 to 4	32 50	@	35 00
Refined Bar	3½	@	3¾
Horseshoes, keg	5 50	@	—
Nail Rod	7½	@	—
Norway, according to thickness	6½	@	7
STEEL—English Cast, lb	14	@	15
Black Diamond, ordinary sizes	14	@	—
Drill	15	@	16
Machinery	12	@	14
COPPER—Ingot	22	@	—
Braziers' sizes	31	@	—
Fire-box sheets	31	@	—
Nails	17	@	—
Bolt	31	@	—
Old	8	@	—
Bar	—	@	—
Cement, 100 fine	15½	@	—
LEAD—Pig	4½	@	4¾
Bar	5½	@	6
Pipe	7	@	—
Sheet	8	@	—
Shot, discount 10% on 500 bags; Drop, ₱ bag	2 10	@	—
Buck, ₱ bag	2 30	@	—
Chilled, do	2 50	@	—
TIN PLATES—Charcoal	6 00	@	6 50
Coke	5 50	@	5 75
Banca Tin	24 00	@	—
Australian	21 50	@	—
I. C. Charcoal Roofing, 14x20	6 50	@	6 80
ZINC—By the cask	10	@	—
Sheet, 7x3 ft., 7 to 10 lb, less the cask	9	@	10
NAILS—Assorted sizes	3 30	@	4 75
QUICKSILVER—By the flask	34½	@	34¾
Flasks, new	1 05	@	—
Flasks, old	85	@	—

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THE HARMON SEMINARY,

Berkeley, Alameda County, Cal.

A FIRST CLASS BOARDING SCHOOL FOR YOUNG LADIES.

Mrs. F. W. HARMON, Principal.

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It is the aim of this institution to furnish the best attainable education for young women. The imparting of useful information and mental culture is attended by the most intelligent effort to develop true womanly qualities, and to instill principles of good taste and sound judgment. Thus, the institution possesses a family character in its best sense.

The charges for tuition and board are made as low as possible without sacrificing excellence, so as to place the School within the reach of those whose means are moderate. It is a principle of this School that those who are wealthy as well as those whose means are limited, should, as a part of their education, be taught to practice economy, and by their example discourage extravagance in dress and personal expenditure, either for ornament or luxury.

It is not an ambition of this School to bring together a large and imposing array of pupils. Its numbers are limited; hence each pupil receives that close personal attention and instruction rendered impossible where multitudes are gathered together.

THE NEXT TERM WILL OPEN JANUARY 3, 1884

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GOLD MEDAL AWARDED
AT
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FOR
Automatic Cut-Off Engine.
SILVER MEDAL AWARDED
FOR
Best Hoisting Engine and Boiler Combined.



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First Premium, Mechanics' Fair, 1883.

We claim this Barrow to be superior to all others manufactured on this Coast. For railroad, mining, grading and general contractor's use, they stand without an equal. We guarantee them to stand more hard usage than any other Barrow yet manufactured. We solicit Correspondence.

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CHILLED CAR WHEELS.

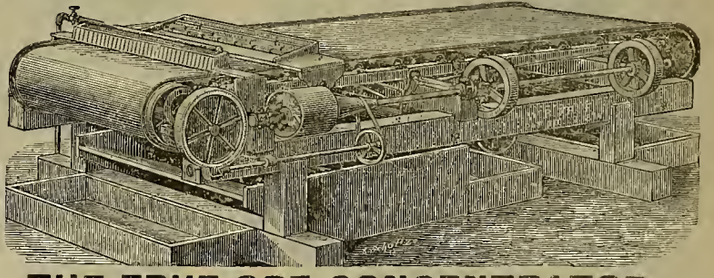
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IRON CASTINGS OF ALL DESCRIPTIONS.

$1,000 CHALLENGE!



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—OR—

VANNING MACHINE.

Over 500 are now in use, giving entire satisfaction. Saves from 40 to 100 per cent. more than any other Concentrator in use, and concentrations are clean from the first working. The wear and tear are merely nominal.

A machine can be seen in working order, and ready to make tests, at the office of Hinckley, Spiers & Hayes, 220 Fremont Street.

To those intending to manufacture or purchase the so-called "Triumph" Concentrator, we herewith state:

That legal advice has been given that *all shaking motion* applied to an *endless traveling* belt used for concentration of ores is an infringement on patents held and owned by the Frue Vanning Machine Company.

That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.

That the patent laws make users of infringements responsible as well as makers, and the public is therefore warned that there is considerable risk in purchasing any end-shake machine until our various patents have been decided.

That if there are those who for any reason prefer an end-shake machine, we can manufacture and sell to such machine of that description, as efficient as the Triumph, and at a lower price, and no liability for infringement will then be incurred by the purchaser.

That we shall protect ourselves against any one making, selling or using any machine infringing any of our patents. Patented July 9, 1867; May 4, 1869; Dec. 22, 1874; Sept. 2, 1879; April 27, 1880. Patents applied for.

That we are, and have been, ready at any time, to make a competitive trial against the Triumph, or any other machine, for stakes of $1,000.

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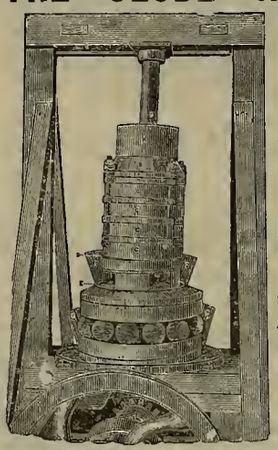
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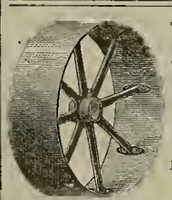
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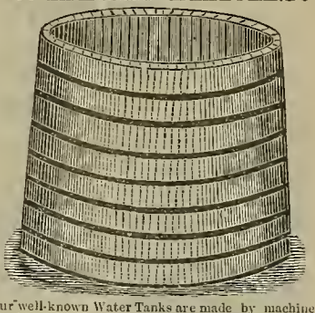
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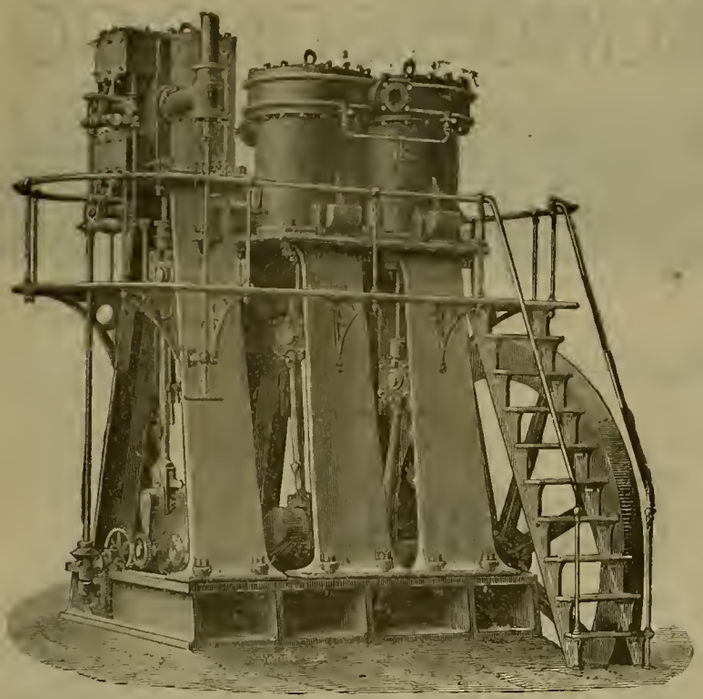
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MORE THAN ONE HUNDRED of them are now running on the Pacific Coast, giving results never before obtained as regards continuous running, economy of fuel, grade and quality of bullion produced. We are prepared to demonstrate by facts the claims here made.
These Smelters are shipped in a complete state, requiring no brick or stone work, except that for the crucible, thus saving great expense and loss of time in construction.
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Absolute certainty in the action of the valves at any speed. Perfect delivery of the air at any speed or pressure. The heating of the air entirely prevented at any pressure. Takes less water to cool the air than any other Compressor.

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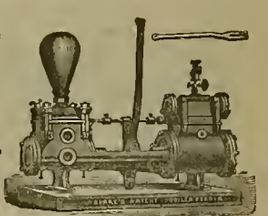


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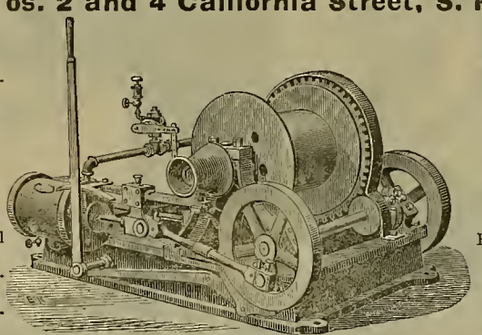


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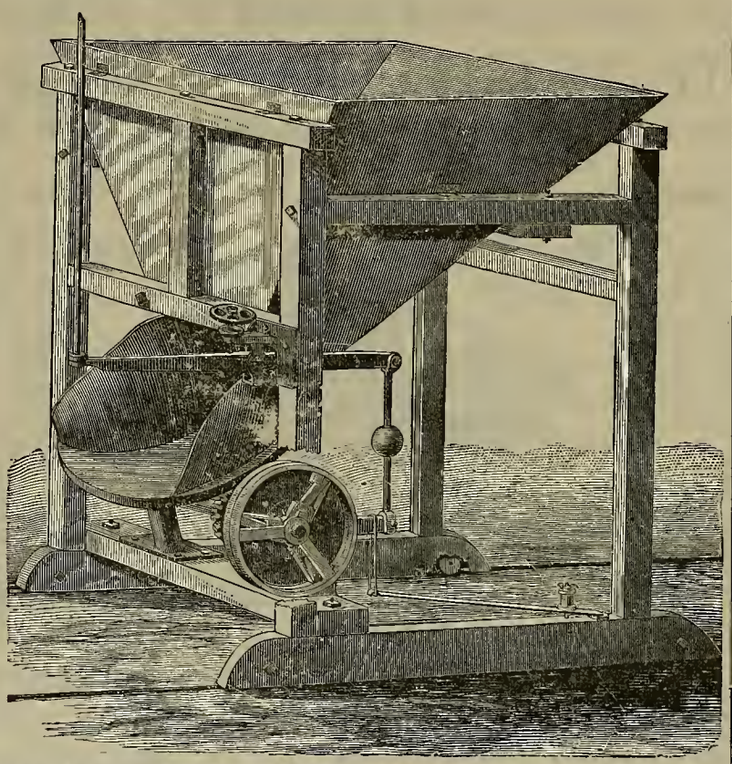
The opposite cut illustrates the recently-introduced Grip and Spring Attachment, which replaces the Weight originally used, and result in an obvious improvement.

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Nashville	20	"	El Dorado "	"
Gross	80	"	" "	"
Julian	20	"	Placer "	"
St. Patrick	15	"	" "	"
Providence	40	"	Nevada "	"
Empire	20	"	" "	"
Idaho	30	"	" "	"
Green Mountain	60	"	Plumas "	"
Plumas-Eureka	60	"	" "	"
Bulwer-Standard	30	"	Bodie, Mono,	
Standard	20	"	" "	"
Noonda	30	"	" "	"
Big Dry Creek	10	"	Fresno "	"
Mexican	44	"	Lyon county,	Nevada.
Santiago	32	"	" "	"
Vivian	16	"	" "	"
Christy	5	"	Uintah, county,	Utah.
Contention	20	"	Tombstone,	Arizona.
Grand Central	20	"	" "	"
Sunshine	20	"	Black Hills,	Dakota.
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Father de Smet	80	"	" "	"
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Highland	120	"	" "	"

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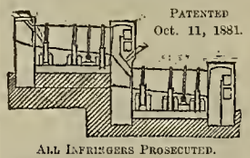
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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, DECEMBER 29, 1883.

VOLUME XLVII Number 26.

The Worthington Mine Pump.

The steam pumps of the Worthington type which have come so largely into use in this country in water works, hotels, apartment houses, etc., are now being introduced on this coast for general work and also for mining purposes. It is claimed that the machine is distinguished for great strength of construction, having few moving parts, with no harsh motions, and not subject to fracture or other derangement. The system of renewal of the working parts has been proved by long experience to be the least expensive and most satisfactory for ordinary work.

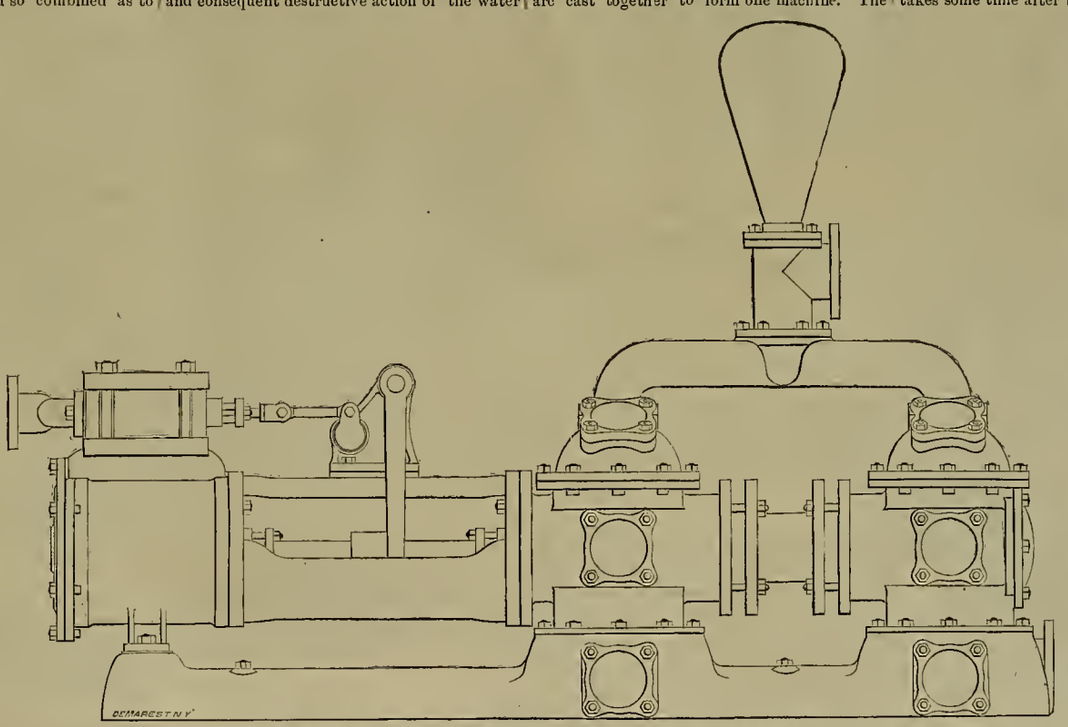
The valve motion is the prominent and important peculiarity of this pump, as being that to which it owes its complete exemption from noise or concussive action. Two steam pumps are placed side by side, and so combined as to act reciprocally upon the steam valves of each other. The one piston acts to give steam to the other, after which it finishes its own stroke, and waits for its valve to be acted upon before it can renew its motion. This pause allows all the water valves to seat quietly, and removes everything like harshness of motion. As one or the other of the steam valves must be always open, there can be no dead point. The pump is, therefore, always ready to start when steam is admitted, and is managed by the simple opening and shutting of the throttle valve. In its application to steam pumps for ordinary service, as well as to water works engines of the largest class, a combination of reliability, with economy in first cost, and in running expenses, is attained, not realized by any other type of pumping machinery. In the arrangement of the Worthington steam pump, special care has been taken to have the parts easily accessible for inspection or repairs. All the moving pieces being made to gauge, can be readily renewed. The successful application of a pump depends much upon its proper selection from among many patterns differing from each other in size, proportion, material and general arrangement.

It is a difficult matter to design and construct a steam pump that will satisfactorily meet the very exacting requirements of mine pumping. The service is generally rough, severe and continuous. Great care must be exercised both in the selection and adaptation of the material used in construction, as the water to be pumped is often of a kind that will attack and quickly destroy it. The location of the mine is usually remote from supplies, and any necessity for renewals or repairs, unless they can be made with unskilled labor and with little delay, may be attended with serious consequences. These considerations therefore demand that a mine pump should be extraordinarily durable, simple and efficient, and have led to the construction of the form of Worthington pumping engine illustrated on this page. In it are embodied the results of the best practice heretofore, together with some important improvements that have been recently secured by letters patent. The plungers of this machine work through central, exterior stuffing boxes, into four separate and distinct water cylinders. These cylinders are all precisely alike, subdivided as much as possible, and having each part or attachment of the one an exact duplicate of the corresponding part or attachment of the other three. This duplication and subdivision greatly facilitates renewals or repairs. The valve areas and water passages are unusually large, so as to decrease the velocity and consequent destructive action of the water currents. The plungers, piston rods, stuffing boxes, and the entire suction and force valve plates are made of a metal composition that has been found best adapted to resist this action. Wherever natural wear will in time take place, the part so worn can be readily and quickly replaced without disturbing any adjacent part.

The pumps are designed to safely withstand a working pressure of 200 lbs. to the square inch, and all their attachments are especially strengthened with a view of meeting the rough usage and hard work to which, in this service, they are liable to be subjected.

Some five sizes of these pumps are kept in stock. The company have now pumps delivering 1,000,000 gallons per day, against a pressure equal to 3,800 feet head; and will contract to force any specified quantity of water to any required hight. There are a few of these mining pumps now at work on this coast. A Worthington pump at Toledo Water Works has been pumping at the rate of 10,000 gallons 100 feet high, at a cost of 3 7-10 cents. The pump at Salem, Mass., has performed a duty 83% better than the average duty of the City of Brooklyn Water Works for 14 years, with expensive beam and rotative engine; more than 123 per cent better than the average duty of Chicago, with their rotatives for nine years; 268 per cent better than the Delaware pumping station for Philadelphia for two years, and 123 per cent better than the Cornish engine, at Louisville, Ky.

Mr. A. L. Fish, manager of the San Francisco office, at 30 and 32 First street, states that the pump here shown may be high pressure, may be compounded, or may be compound and condensing. The durability and smooth and noiseless action of this pumping engine greatly commends it. To effect the valve motion two steam cylinders and two pumps are cast together to form one machine. The right hand division moves the steam valve of the left hand one, and vice versa. Under this arrangement one pump takes up the motion when the other is about to lay it down, thus keeping up a uniform delivery, without pulsation or noise. As the work is divided between two engines, the wear is also divided, and the lifetime of the machine doubled.



THE WORTHINGTON STEAM PUMP FOR MINING PURPOSES.

The local papers assert that the outlook has never been so fine in the Paradise, Nevada, mines as at present, large bodies of high-grade ore having been discovered both in the Wild Goose and Paradise Valley mines. For many years nothing but assessment work has been done on these mines, but there are now some forty or fifty men employed in each of them, and they are sending away an average of $25,000 per month. It is believed that the vein is permanent and the ore bodies extensive.

A vacuum motor machine company has just been organized at Portland, with a capital stock of $1,200,000.

A Mining Review.

It has always been our custom to publish an extended review of mining operations for the year, about the third week in January, and it is our intention to continue the custom this year. We shall, however, publish a larger quantity of matter than usual and will issue a double number of 24 pages. It is the purpose to give all the attainable figures of ore yield and bullion product from the different camps and districts of the mining States and Territories, together with such facts as will give the reader a general idea of the progress of the mining industry. Special attention will be paid to mining on this coast.

The reason for not issuing the "Annual Review" on the first week in January, is that it takes some time after the first of the month to obtain the returns, and as we desire them to be as full as possible we prefer waiting until the necessary facts can be compiled.

It is intended to issue a much larger edition of the number referred to than usual, as it will contain a large amount of matter which will be of use to those persons who have only a general interest in mining, as well as to those directly connected with the industry. In the latter class, however, it will be of special value, as much of the material being statistical will be worthy of preservation for reference.

We should be pleased to receive from any of the mining camps or districts reached by the Press, any observations as to progress or yield which may occur to residents or those having knowledge of the facts. There are many smaller camps that are prosperous, but of which little is said. We endeavor to notice them as frequently as possible in our regular "Mining Summary." For a general review, however, we must depend on some resident, and now urge upon them a request to send us such facts about the year's work as will be of general interest. We will receive and publish them with pleasure.

The Inyo *Independent* says: It is reported from authentic sources that it is exceedingly likely that arrangements will be made to immediately start the copper furnace at Soda Springs. This will be agreeable news for the owners of copper mines, as it will open a near market for the sale of copper ores, where both high and low grade ores can be realized upon.

New silver mines have been discovered in San Bernardino county on the edge of the Mojave desert, about forty miles south of Calico. The ores from the mines are chlorides, and the discoverers believe they will prove as rich as those at Calico.

CORRESPONDENCE.

Notes in Nevada.

[Written for the MINING AND SCIENTIFIC PRESS.]

Volcano Mountain—Petrographic Features—Extinct Solfataras or Geysers.

Between Walker Lake and Candelaria the Carson and Colorado railway traverses desert valleys and playas or sun-baked mud flats which occupy the lowest depressions between the bordering mountain ranges. That these are the beds of exiccated lakes is apparent in the extensive deposits of common salt, borax and other residual salts now profitably worked near Soda Springs and in adjacent valleys.

The country is one of extreme sterility and desolation; even the yucca, mesquite, cacti and other arid growths of desert lands farther south are absent, and sage is almost the sole representative of vegetable life. The rugged mountains rise on either hand of strangely tossed and tumultuous aspect, like monstrous billows petrified in the act of motion; the grand cleavages of gorges and arroyos, the varied hues and flexures of the strata, and every minor cleft and wrinkle being wonderfully limned and distinct in the dry air and glare of the sun, utterly unveiled by visible soil or vegetation.

Providentially, these forbidding wastes are replete with minerals useful to man, or the "Iron Horse" of civilization would not now awaken the echoes that through unrecorded time have known only the sounds of nature and the coyote's cry.

Nearly midway between the points mentioned, in the range on the north side of Soda Springs Valley, and a few miles from the new town of Luning, stands the rugged mass known as Volcano Mountain, which is not of plutonic origin, however, but is a vast uplift of limestone silicious schists of Paleozoic age, tilted to an angle of about 60° on its southwestern face.

This mountain is thickly seamed with metalliferous veins, severally carrying iron, lead, copper, antimony and silver, although as yet no extensive or profitable mine is opened therein.

This notable upheaval is especially interesting in its evidences of extinct thermal action, there being a line of ancient geyser vents on its southwestern face, at an altitude of 1,500 feet above the valley.

These vents are almost wholly closed by deposits from the receding solution; but one remains intact, of elliptical form, three feet by five feet in diameter, with mouth and spout-like lip, beautifully encrusted with crystals of spar.

I explored the inner recesses of this dead fumarole or geyser at considerable risk, and with no small discomfort, finding the cavity a few feet beyond the mouth expand to cavernous proportions, thence dropping sheer in an almost vertical spiral like the whorled chambers of some colossal shell to deeps unknown.

A pungent impalpable dust, the residuum of ages, had settled on every possible lodgement and assailed eyes and nostrils at every movement, almost quite obscuring the candle's dim glimmer.

The exploration was effected by the aid of a rope secured to a stick across the entrance—the descent being at times down a steep spiral channel eight or ten feet across—constricting now to a narrow throat, and again expanding into abysses of unknown depth, whose sheer, undersloping walls left the investigator no alternative but to retreat or swing down the rope by hand-grip into gloom and uncertainty.

The actual depth penetrated was about one hundred feet; but the floor which barred further descent was evidently a false bottom formed by the lodgement of fallen masses in a constriction of the channel.

Future mining operations will doubtless develop extensive caverns in the heart of this mountain, and, very probably, valuable metallic deposits.

Further evidence of extensive solfataric action appears in a huge ferruginous dyke which traverses the western flanks of Volcano mountain, thence sweeping in a wide circle around the slopes of a vast amphitheater, or basin of erosion, lying westward.

At one point along this dyke is found a deposit of nearly pure sulphur in solid nodules and concretions, from a few pounds each to several hundred weight, which may prove of much importance on further exploration.

The dyke is inclosed in calcareous strata which dip quaquaversally from the center of depression; and here the disturbing cause appears in the apex of a granitic peak which the deep erosion has uncovered.

* * * * * * *

Standing in the utter solitude of these gigantic upheavals, where, peering afar through hazy expanse,

> —"The eye may dimly trace
> A gossamer, as finely spun
> As spider's web, shine in the sun—
> Man's highest triumphs over space,"

And watching the worm-like train that creeps with barely perceptible motion through dreary leagues below, man realizes his physical insignificance in the vastness of nature.

Here, surely, might all human vainglory feel its futility, where an army of men—where the population of a great city—nay, the great city itself, might be

> "Sown in a wrinkle of the monstrous hill,"

and hide from the world its whereabouts!

A Paleozoic Beach — Fossil Characteristics, etc.

On the eastern flanks of Volcano Mountain, a distance of 3,000 to 4,000 feet horizontally through its base, from the granitic intrusion spoken of, and, approximately, 6,000 feet above sea-level, I found a well-marked fossiliferous belt of silurian age, which I traced and examined superficially, about one mile in lineal extent, and from one to three hundred feet wide.

This formation trends north and south over some minor ridges and *arroyos*; the portions most prolific in organic remains being an indurated sandstone and coarse arenaceous shale, in parts thickly intermixed with comminuted shells—doubtless the *exuviæ* of an ancient seashore.

These strata are flanked with finely-laminated shales, silicious limestones, quartzites, and other rocks exhibiting more or less metamorphism, in which the fossils grow fewer and ultimately fade out.

The remains were chiefly silicious casts of silurian mollusca which but rarely retained the calcareous structure of the originals.

The most abundant forms are of bivalves allied to the mussel and clam; a few *orthis lynx* and *orthis testudinaria*.

The gasteropods are represented by Pleurotomaria and Murchisonia, and the cephalopods by Orthoceratites and close-coiled Lituites. Of coral form I discovered only a few Cyathophylloids, probably Zaphrentis Canadense.

At different points along the fossil belt certain types were predominant to the exclusion almost of all others. Thus, for a considerable distance the bivalves prevail; in other portions Gasteropods occupy the ground, and at the higher and northern end of the formation, where it disappears on the crest of the hill in highly metamorphosed strata, the Lituites swarmed prolifically, and grew to a diameter of twelve or fifteen inches.

No trace was found of radiata or crustacea—not even of trilobites; and until a more thorough and competent examination of its fossil evidence is made, this formation may be assigned to a very early geological age—not later, probably, than the Trenton epoch of the Lower Silurian.

In consequence of the fissured and indurated character of the inclosing rock, no complete fossil specimens were gathered, with the exception of one small ostrea; doubtless, however, tolerably perfect forms may be secured by removing the weathered surface rock.

M. I. ANSON.

Assay of Salt.

Take a fair sample of the salt to be assayed. It must not be dried, because what is required is its value for the production of chlorine in the condition in which it is to be weighed for working, but if too coarse it should be crushed. Mix thoroughly. Dissolve 10 grains in about 50 grains, or rather less than ½ fluid ounce, of distilled or rain water, or at least water which gives no precipitate on addition of a drop of solution of silver in nitric acid. Filter the solution through a small wetted filter of fine bibulous paper. The filter must be well washed with water to completely remove the salt solution, and the filtrate and washings received in a flask.

To the filtered solution in the flask, add, drop by drop, a solution of silver nitrate until no further precipitation of silver chloride takes place. Warm slightly, and shake vigorously, stopping the mouth of the flask with a greased cork, until the precipitate is found to settle readily, leaving the liquid clear. Now transfer to a small filter, the weight of which has been previously ascertained after drying on a water bath until it no longer lost weight. Wash the precipitate and the filter with hot water until the washings are tasteless. Dry the filter containing the precipitate on a water bath until two successive weighings give the same result. From the weight obtained deduct that of the filter; the remainder will be the weight of silver chloride produced by ten grains of salt.

If the salt were pure and dry, 10 grains would produce 24.53 grains of silver chloride, but if we say 24.5 grains it will be sufficiently accurate. Multiply the weight of silver chloride found by 100, and divide by 24.5; the result will be the percentage of pure salt in the sample. EXAMPLE.—The silver chloride obtained from 10 grains of the sample weighs net 19.3 grains; then the sample contains $1930 \div 24.5 = 78.77$ per cent. of pure salt.

The silver chloride should be dried without much exposure to light. For a waterbath, the cover of a vessel in which some water is boiling answers very well. The pulp scales used in assaying ore are sufficiently accurate for this work, if sensitive to .1 grain.

The salt sometimes contains a considerable quantity of sodium carbonate, which neutralizes an equivalent quantity of acid. In the interior of the country, where this is most liable to occur, acid is very expensive on account of the cost of freight. Such salt should therefore be purified, by dissolving it in water and exposing the solution to evaporation in shallow vats, when the purified salt will be deposited. —*Aaron's Leaching Gold and Silver Ores.*

Amount of Salt Used With Ore.

Ores containing from 80 to 100 ounces of silver per ton should be mixed with ten per cent of salt. This is about the quantity considered necessary in the amalgamation works of Europe. Rich ore is often roasted with 20 per cent of salt. If all the chlorine of the salt could be transferred to the silver, an insignificant amount of salt only would be required for ores containing 100 ounces of silver—not more than 3½ pounds to the ton; but in consequence of the different ways in which the chlorine decomposes and unites with base metals and gases, the escape of chlorine from the surface of the ore without coming in contact with the silver, etc., a great deal more of the salt must be applied.

The usual amount of salt used for ores of the above value is from 120 to 140 pounds per ton of ore; that is, from 6 to 7 per cent. It is not advisable to take less than 6 per cent, even if the ore be poorer. There are instances, however, where 91 per cent of silver has been obtained by amalgamation from ores which were roasted with only 5 per cent of salt, and even less. There was no natural chloride of silver in the ore when treated with 5 per cent. (Rising Star ore, Idaho.)

As the salt is not at all decomposed before the formation of sulphates commences, or only to a very small extent, it is also in this respect immaterial whether the salt is charged at once with the ore or whether it is introduced two hours later, unless the ore is of such a nature as would bake easily on a little increase of heat. In other cases, however, it is obvious that, taking only six per cent of salt, and employing only one man at a furnace, a perfect mixing in a short time, as ought to be done if the salt is charged after the sulphur is burned off, can not be expected, and consequently a defective result will follow. It is, therefore, under such circumstances, important to have the salt and the ore introduced at the same time.

But a point of importance is the time when the salt should be added, if other objects are in view. If the salt is added together with the ore, or after the sulphur is expelled and sulphates are formed, in every instance the base metals will take up their share of the chlorine, and therefore more salt will be required. But, as the most of the chlorides are volatile, the salt is the means of getting rid of a great deal of the metals during the roasting, which in some instances is not very desirable. For instance, if a great deal of antimony and copper is in the ore, more or less chloride of silver will escape; sometime, however, only a small percentage. Treating the ore with salt from the beginning, or adding it two hours after the beginning, the result is the same.

A different result is obtained if the salt is added after all the base metals are desulphurized and oxidized. Some base metals, as antimony and arsenic, will be volatilized and thus gotten rid of, but not in so large a proportion as if chloridized. Iron and copper remain entirely in the ore, while both are volatile as chlorides. The roasting must be continued at a light red heat till all sulphates are decomposed and the metals oxidized. Applying the salt after the dead-roasting, the effect differs from the above so far that the base metal oxides now are not chloridized, or only to a small extent, while the silver alone (some of which appears to be changed to a metallic state, the most, however, remaining as a sulphate) will be chloridized. But in order to effect this chlorination, from one to two per cent of green vitriol must be added in order to accomplish the decomposition of all the salt. The copper is lost with the tailings unless smelted or extracted by diluted sulphuric acid.—*Kustel's Roasting Gold and Silver Ores.*

Wages in San Francisco.

Among other documents received by the Labor Bureau lately is the following statement of the Central Railroad Company of this city as to the wages of their employees and their hours for work. This statement applies to the services of 98 men:

Employees.	Wages Per Day.	Employment. Hours.
Foreman	$2.66	12
Conductors (men)	2.06	14½
Drivers	2.03	14
Hostlers	1.66	12
Blacksmiths	3.00	10
Trackmen	2.00	10
Other mechanics	2.75	10
Watchmen	1.66	12
Starters	2.33	12
Laborers	2.00	10
Teamsters	1.75	10

Central Pacific Employees.

The commissioner has also received the following elaborate statement from the Central Pacific Railroad Company, giving the number of employees and rates of pay of different classes, based on the month of November, 1882. The total number of employees cited in this document is 9,066; Clerks—6 at $200, 1 at $180, 4 at $175, 1 at $170, 2 at $165, 2 at $160, 11 at $150, 5 at $145, 10 at $140, 11 at $135, 3 at $130, 18 at $125, 7 at $120, 8 at $115, 6 at $110, 4 at $105, 32 at $100, 2 at $95, 27 at $90, 9 at $85, 2 at $80, 35 at $75, 4 at $70, 15 at $60, 4 at $50, 206 at $50 to $150; porters, 18 at $40 to $90; messenger boys, 4 at $20 to $35; agents, 225 at $50 to $225; station laborers, 740 at $60 to $75; conductors, 221 at $65 to $115; brakemen, flagmen, etc., 740 at $65 to $80; laborers, rodmen, etc., 64 at $35 to $90; pumpers, 60 at $65 to $85; patrols, 197 at $42 to $55; laborers, 1,367 at $42 to $55; laborers, 1,437 at $45, $50 to $52; laborers, 654 at $55; clerks, 29 at $80 to $200; mechanics, 845 at $52 to $84; engine wipers, 143 at $60; car cleaners, 90 at $60; steamer crews, 287 at $60 to $175; shipyard hands, 17 at $85 to $104; engineers, 394 at $85 to $145; firemen, 388 at $65 to $80; clerks and draughtsmen, 12 at $75 to $200; foremen, 79 at $105 to $200; mechanics, 570 at $60 to $85; watchmen, 50 at $55 to $60.

The Ophir Mine

From the report of the Superintendent of the Ophir mine we take the following:

Ore extracted, 3,878 1810-2000 tons, which has yielded $36,607.34 or at the rate of $9.44 per ton, being about 60 per cent of the assay value. This ore has all been taken from above the level of the old Central tunnel, Work in the levels, between the 1,600 and 2,700-foot, has been but light. Work has been carried on more extensively in the 2,900 and 3100-foot levels. In the former a drift has been run to the south line and continued by the California company. To facilitate the extraction of low grade ore, the upper workings have been repaired and retimbered. During the past few months the work has been confined to the working of the low-grade ore in the upper parts of the mine. The purchase of the Morgan Hill property will allow lower grade ore to be profitably worked. The report concludes: "When the main north lateral drift on the 3,100-foot level, between the Ophir-Mexican and Sierra Nevada-Mexican winzes is completed, the explorations in the 3,100 level should be resumed, as the late developments in the Mexican ground have demonstrated the fact that the vein, through which the Ophir-Mexican winze was sunk, is continuous and strong down to this point, indicating that something of value may be found on further exploration."

Superintendent's Financial Statement

For the year ending November 30th, 1883:

RECEIPTS.

Balance last year's report	$3,336.57
Salaries	58,847.00
Supplies and mining expenses	34,015.53
Office expenses	75.05
Drafts on President	297,353.36
Total	$393,627.81

DISBURSEMENTS.

Salaries	$167,985.16
Supplies, etc	154,674.35
Office expenses	595.45
Legal expenses	416.67
Water and ice	7,820.05
Taxes	3,349.42
Milling	25,995.64
Sutro Tunnel royalty	1,944.35
Morgan mill expenses	29,377.54
Exchange	751.50
Gross expenses	$392,810.13
Balance cash on hand	817.68
Total	$393,627.81
Gross expenses	$392,810.13
Received from other mines	92,937.88
Net expenses	$299,872.25

The Secretary's Report

Was as follows:

DISBURSEMENTS.

Legal expenses	$416 67
Assessment	377 00
Insurance	1,800 00
Supplies and mine expense	120,658 52
Office expense (Virginia)	520 40
Water and ice	7,820 05
Taxes	3,639 72
Freight on bullion	121 70
Reduction of ore	25,995 64
Sutro Tunnel royalty	1,944 35
Discount on bullion	2,475 87
Interest on exchange	926 05
Wages and salaries	109,126 16
Office expenses (San Francisco)	5,856 55
Morgan mill property	16,000 00
Morgan mill supplies	13,377 54
Superintendent's balance account, 1883	817 68
Bullion on hand (gold)	13,855 78
Bullion on hand (silver)	7,554 09
Total	$333,295 77

RECEIPTS.

Supt's. balance account December, 1882	$3,336 37
Cash on hand December, 1882	3,176 26
Bullion on hand December, 1882	12,610 07
Assessments (Nos. 43, 44, 45)	252,000 00
Gross bullion product	33,500 60
Cash overdraft (December, 1883)	28,661 71
Bullion samples	10 91
Total	$333,295 77
The Ledger balance shows a total expenditure of	$359,371 85
Receipts (assessments)	252,000 00
Gross product	33,500 60
General revenue and expenses	45,209 69
Cash	28,661 71
Total	$359,371 85

MENDOCINO COUNTY contains 2,000,000 acres all told, of which 64,000 are under cultivation, and 500,000 are timber land. Maximum price per acre, $100; minimum, $2; average, $10. There are about 1,000 ranches in the county belonging to about 800 owners. Maximum rent of land per acre, $15; minimum, $ 1; average, $2. There are about 10,000 miles of fencing in the county, costing $300 a mile. The maximum wages paid to farm hands per month, including board, is $30; minimum, $20; average, $25—said laborers finding employment during all the months of the year. The daily hours of labor range from eight to twelve. According to the Assessor's report, there is not one unemployed laborer in Mendocino county. Within the county bounds there are only twenty-five miles of railroad, and none of the highways are macadamized.

DURING the three weeks ending December 8th, 274 cars and 70 sacks of ore, bullion, lead and lead pipe, were shipped out of Salt Lake, amounting to 6,855,527 pounds.

MECHANICAL PROGRESS.

A New Heat Motor.

Mr. Bourne, C. E., the principal of the new Engineering College at Muswell Hill, England, and author of various practical works on the steam engine, has, we are informed, been engaged during the past year in perfecting a new species of heat engine which, it is expected, will supersede the steam engine for nearly all the purposes for which that is at present employed. It has long been known that the steam engine is a most wasteful machine, not more than one-tenth of the theoretical efficiency of the heat expended being obtained in even the best engines, the other nine-tenths being wasted. It has also long been known that power can not be generated by heat unless there be two unequal temperatures; and that it is in the act of falling from the high temperature to the low that the heat is transformed into power. The farther removed these two temperatures are from one another the larger will be the proportion of the total heat transformed into power; and it is because in the steam engine these two temperatures are not far apart that the heat is wasted to so serious an extent. The maximum temperature in a steam engine is the temperature of the steam, which may be 250° or thereabout; and the minimum temperature, which is that of the condenser, may be 100°; so that the total fall from the highest temperature to the lowest may be about 150. The power generated by this inconsiderable fall will not be great, any more than the power will be great which is got from a low fall of water by any hydraulic machine. But the conditions under which steam can be worked in an engine imply limited extremes of temperature, and therefore a large expenditure of fuel to generate a given amount of power. To enable higher temperatures to be employed in engines for the generation of power, air has been proposed as a substitute for steam, and air engines have been contrived by Stirling, Ericsson, Joule, and others. But the difficulty of heating the air by any species of air boiler, and of preserving the piston in a working condition at high temperatures has so seriously impaired the advantages of these contrivances that they have never come into extended use. Under Mr. Bourne's arrangement these objections are avoided. There is no air boiler, but the fuel is injected into a small chamber so that the heat is generated internally instead of being transmitted through heating surfaces. The maximum temperature employed is the temperature of flame. But the engine is so contrived that the piston is not subjected to any higher temperature than is usual in steam engines. It is stated that an engine constructed upon this principle may be made so compact and so light as to be applicable to many purposes for which steam engines cannot be used, such as flying, tramway locomotion, and the propulsion of tricycles, while the economy of fuel will be such, by reason of the high temperature employed, that a very inexpensive performance will be obtained.—*London Iron.*

Injury by Heat.

In some mechanical processes the production of heat by friction is a serious injury to the value of the time and the material employed and used. Machines must be cooled to do their work well, and parts which are particularly exposed to friction must be renewed frequently to keep the productive value of the machine intact. If means could be found to kill the heat at the moment of its generation, some mechanical processes would be forwarded, and others made more profitable. The hardest steel cannot withstand the disintegrating effects of heat by friction, even when the friction is produced by contact with a much softer metal. In the ordinary rivet machine, where copper rivets are made for belting purposes, the heading hammer is a cylinder of hardened cast steel. It strikes a blow against the end of a bit of soft copper wire, and instantly so much heat is evolved that not only is the rivet too hot to be handled, but the steel hammer is affected to almost as great an extent; at least, the repeated blows of the steel against the soft copper anneal the steel and rapidly destroy its integrity.

In the lathe turning of steel, and in the production of machine screws from the bar or rod, rapid work can be done by means of a constant flow of oil or of water; in some instances so high a speed as eighteen feet per minute has been profitably reached in the turning of steel when a constant stream of water plays upon the point of the turning tool. Still there are cases where, in turning, the depth of the chip prevents the cooling water from reaching the point of the tool; and in the case of the hammer blow of the rivet machine, the application of a constant stream of water or oil would seem to be inconvenient, if not impossible. There appears to be room for improvement and remedy in this department of metal working; possibly chemical contrivance may be successful where mechanical means have failed.—*Scientific American.*

THE TRANSMISSION OF POWER.—In a prize essay by Herr Beringer on the transmission of power for long distances, it is stated that electric and wire-rope transmissions (the latter up to a length of about two-thirds of a mile) are the best. Above that distance, electricity is to be preferred. The power of a hydraulic motor may be transmitted to distances of 12 miles without becoming more expensive than steam power generated on the spot. For electrical transmission another 6 miles may be added to the distance, so that in a locality where cheap water power exists machines may be actuated by electricity with advantage within a circumference of 18 miles. Beyond that distance, however, steam motors are more economical. If there is no water power, and the erection of a central steam engine becomes necessary, a wire-rope system works with greater advantage, and is only to be rejected in towns, because, in such cases, wire-rope traction loses greatly by the necessary branching off. The erection of a separate motor becomes cheaper where energy of 10 horse-power and above is required. Water and air are far exceeded by electricity for transmission of power, and if motive power is to be transmitted 6 miles from a central steam motor, it can be done economically only by electricity.

COST OF LOCOMOTIVE POWER.—The cost of locomotive power on the Grand Trunk Division of the Grand Trunk Railway of Canada, says the *Railway World*, was 12.06d. per engine mile in the first half of this year, as compared with 11.62d. per engine mile in the first half of 1882. The loss of engine power, owing to delays on the entire line, from snow, etc., during the first four months of the past half-year, as compared with the corresponding period of 1882, amounted to the use of 37 engines per day, continuously, for each 24 hours. The total increase in the cost of locomotive power in the first half of 1883, as compared with the corresponding period of 1882, was £37,406, or 13½ per cent. As illustrative of the increased difficulties entailed by the greater severity of the winter, it may be stated that engines employed in working snow-plows and ice-breakers ran 58,021 miles, as compared with 5,427 miles in the half-year ending June 30, 1882, showing an increase of about 970 per cent.

COVERING IRON AND STEEL WITH COPPER.—According to the *Metallarbeiter*, iron can be coppered by dipping it into melted copper, the surface of which is protected by a melted layer of cryolite and phosphoric acid. The articles to be coppered must be heated to the same temperature as the melted copper. Another process consists in dipping the articles into a melted solution of one part of chloride or fluoride of copper, and five or six parts of cryolite, and a little chloride of barium. If the article, when immersed, is connected with the negative pole of a battery, it hastens the process. A third method consists in dipping the article in a solution of oxalate of copper and bicarbonate of soda, dissolved in ten or fifteen parts of water, acidified with some organic acid.

ABOUT BELTING.—The horse-power of a belt equals velocity in feet per minute, multiplied by the width—the sum divided by 1,000. One inch single belt, moving at 1,000 feet per minute—1 horse-power; double belts about 700 feet per minute, per 1-inch width—1 horse-power. For double belts of great length, over large pulleys, allow about 500 feet per minute, per 1 inch of width per horse-power. Power should be communicated through the lower running side of a belt; the upper side to carry the slack. Average breaking weight of a belt, 3-16x1 inch wide—leather, 330 pounds; 3-ply rubber, 600 pounds. The strength of a belt increases directly as its width. The co-efficient of safety for a laced belt is, leather—1-16 breaking weight; rubber—⅛ breaking weight.

STEEL CHAINS.—Experiments are now being made at the Washington Navy Yard in the manufacture of 1½-inch steel chain to take place of the 1⅞-inch iron chain now in use. The difficulty heretofore encountered in manufacturing steel chain was the trouble experienced in welding it. The naval authorities have, however, succeeded in getting a quality of steel from Pittsburgh adapted to welding, a section of chain made from it having been tried recently in the testing machine and found satisfactory. A quantity of it will soon be issued to the United States vessels on the home stations and subjected to a practical test, and, if satisfactory, will probably be generally introduced in the navy.

ILLUMINATION OF STEAM BOILERS.—The lighting up of the interior of steam boilers was long ago suggested. It has lately been carried into practical operation by the Patent Steam Boiler Co., London. They arrange lights within the boiler in such a way that the cascades, currents and miniature whirlpools of the water may be clearly observed. It is believed that useful information will be derived from the observations touching the cause of priming, the best modes of separating steam from the water, etc.

STEEL CARS.—According to the Denver *Journal of Commerce*, the Denver and Rio Grande Company are contemplating the manufacture of steel cars in the near future. A sample car will soon be commenced at their shops in that city. It is intended to heat the car by steam and light it by electricity.

SCIENTIFIC PROGRESS.

Philosophy of Oil Calming Waters in a Storm.

At the recent meeting of the American Association for the Advancement of Science, Mr. E. P. Calverwell read a paper on "The Probable Explanation of the Effect of Oil in Calming Waters in a Storm." He said that when the surface of the sea had become quite smooth after a storm, it was very common for long rollers to break on a sand bar. If there were no wind and the sea glossy, these would not break until quite close to the shore, even though the ordinary theory pointed to their breaking earlier, unless a force directed in the opposite direction to that of their motion were exerted on the wave. Such a force might be supplied by the wind; but if it rose in any direction the waves broke much sooner. This effect was therefore due to some secondary effect produced by the wind pressure, and not directly by the pressure itself, and it was to the ripples produced on the surface (which disturbed the wave motion) that the speedy breaking was to be attributed. It was, however, a direct result of theory that the ripples depended on surface tension for their propagation, and could not exist in large amount on the oiled surface. It was also evident that the hold of the wind on the wave was greatly decreased by the absence of ripples, and thus the oil acted both to prevent the wind having much effect on the surface, and also to prevent the motion of the water in the wave being such as to cause breaking. The amount of friction might perhaps sensibly influence the breaking, but definite experiments on this were still wanting.

ALUMINIUM METAL.—This metal appears to be just coming into general use. It is now being extensively applied in the manufacture of field telegraphs and telegraph connections, large orders having been received from the British government. The application of the metal to jewelry, mathematical and musical instruments and the like is very greatly increasing. Twenty tons of goods, worth $150,000, made from the alumina metals were recently shipped from Liverpool to be shown at the Calcutta exhibition. Among the exhibits were screws, wire and other articles, pens and pencil cases, railway carriage fittings, locks and bolts, harness furniture in great variety, chandeliers, electro plate, cutlery and ships' fittings. These had been produced by firms in London, Glasgow, Leeds, Sheffield, Birmingham, Wolverhampton, and other towns. One of the most important characteristics of this metal is its almost absolute freedom from corrosion. The report of a late English commission appointed to inquire into the condition of four-bladed propellers which have been cast in it shows that the experiments have been quite successful, and that the metal is absolutely uncorrosive by the action of salt water. Mr. Webster and his process for its manufacture have both been subjected to considerable criticism since he formed a company a twelvemonth ago to develop his process. But the company has gone on steadily working, and they assert that they are now in a position to point to the remarkable success of the undertaking.

A NEW INSULATING MATERIAL.—According to an account in *Engineering*, Mr. E. T. Truman, of London, England, has brought out a new insulating material, consisting essentially of plumbago, or black lead, mixed with gutta-percha, india rubber or ozokerit. When the gutta-percha is of poor quality the proportions are 50 parts of gutta-percha and thirty parts of graphite; but the better the gutta-percha the greater the proportion of graphite, which can be used up to 50 per cent. The graphite, which must be very dry, helps, according to Mr. Truman, to preserve the gutta-percha. The black lead is chosen for its high insulation in the first place, then is carefully sifted, dried and mixed with the gutta-percha in a masticator or condenser. The resulting insulator is applied to wires by the ordinary machines for covering. Ozokerit may also be mixed with the compound in small proportion. A black lead surface of a protective character is also given to gutta-percha wires by Mr. Truman, and its lubricating surface assists in the manipulation of the wires in pipes.

WHAT BACTERIA ARE.—Dr. Rollin R. Grigg, of Buffalo, N. Y., after a series of experiments to ascertain the nature and characteristics of bacteria, bacilli and other creatures, whose existence is relied upon by advocates of the "germs theory of disease," as opposed to the disease theory of germs, has given the following as results and their explanation: By boiling a quantity of healthy blood he obtained all the forms of bacteria. Then with some pure fibrine, obtained from a washed clot of blood and boiling it, proving it was the threads of fibrine broken up into pieces and granules that gave the bacteria, the same results were obtained. Next some blood was obtained and rotted under warmth, and closely watched for two months; and here again all the forms were obtained that the fresh boiled blood gave. From these experiments Dr. Grigg concludes that all the bacteria of disease are forms of fibrine; and, for the general good requests all investigators to repeat the experimental work and report to the public the results of such investigations.

NEW TEST FOR OXYGEN ELIMINATED BY PLANTS AND ANIMALS.—Engelmann has devised the following ingenious test for oxygen, which is described in *Wiedemann's Annalen*. It depends on the fact that the bacteria of putrefaction do not move except where free oxygen is present, and, when the oxygen grows scarce, they collect in those places where there is still some free oxygen, as in air bubbles, etc. The advantages of the bacterial method employed by Engelmann for investigating plant assimilation consist chiefly in this, that it enables him to detect the smallest trace of oxygen to the trillionth part of a milligramme, and at the same time to determine with microscopic accuracy the places where the oxygen is given off. He found that only those cells which contain chlorophyl give out oxygen, and that only in the light. The action of light is strictly local; it begins the moment that light strikes it, and seems to cease instantly when darkness comes on.

SULPHUR PHOSPHORESCENT.—K. Neumann raises the question whether sulphur, selenium, arsenic, etc., are not, under suitable circumstances, capable of phosphorescing like phosphorus. He finds that when sulphur is heated on a metal or porcelain plate in the dark, the vapors suddenly become phosphorescent, burn with a bluish-gray flame, perfectly distinct from the ordinary fine blue flame of sulphur. The odor given off is not that of sulphurous acid, but resembles that of hydrogen persulphide, camphor, and ozone. The product of the combustion is doubtless a stage of oxidation lower than sulphurous anhydride.

THE MAGNETIC POLE.—Prof. Thompson, in a lecture at Glasgow, stated that the magnetic pole is now near Boothia Felix, more than 1,000 miles west of the geographical pole. In 1657 the magnetic pole was due north, it having been eastward before that. Then it began to move westward until 1816, when the maximum was reached. This is now being steadily diminished, and in 1976 it will again point true north. Professor Thompson says that the changes which have been observed, not only in the direction but in the strength of the earth's magnetism, show that the same causes which originally magnetized the earth are still at work.

CUTTING OFF THE HEAD NOT KILLING.—S. R. Canestrini has been experimenting on the effects of decapitation of insects. Butterflies were able to use their wings eighteen days after they had lost their heads. Crickets leaped on the thirteenth day after they had been beheaded, and the preying mantilla showed signs of life on the fourteenth day after the head had been separated from the body. He gives still more singular observations tending to show that the head in insects cannot be subject to the same perpetual strain as the head in mammals in guiding the motions of the body.

TRANSFER OF ENERGY BY ELECTRICITY.—In discussing Tresca's experiments at the Northern Railway station, the President of the Society of Civil Engineers remarked upon their great value. Even if a quarter of the original energy could be transmitted, there would be many cases in which a force could be transported to a distance, which it would be impossible to produce at the place where it is used. M. Cretien thought that the delivery would vary largely under varying conditions. He claimed personally to have transmitted 60 per cent in some cases, and even more.

LUMINOUS PAINT.—The latest useful application of luminous paint is referred to as follows: "Some useful applications have lately been made in England of luminous paint where it is desirable to render objects visible in the dark, such as life and mooring buoys, numbers of vessels, dangerous rocks and headlands, a large rock having recently been painted. Perhaps the most striking application is the painting of the mariner's compass on board ship, by which means it is rendered clearly visible, and the course can be easily kept should the lamp be extinguished."

A NEW INCANDESCENT LAMP.—There was recently shown at the Industrial Science Society of Lyons a new semi-incandescent lamp, giving the brilliancy of an arc lamp. It was made of two carbon rods, slightly inclined to one another, brought down on to a small prism of chalk, and separated from one another by a small rod of the same material. The current passes through the chalk rod, making it incandescent. By this means the light is rendered steadier than an arc light, and it is said to have the same brilliancy.

THE CHEMIST'S AID INVOKED.—A correspondent of the *Scientific American* asks: "Cannot the chemist, with the aid of non-injurious chemicals, assist us to improve on present methods for the clarification of raw and cold cane-juice, and so that it can be done without the aid of fire heat?" He suggests that the subject is of sufficient importance to our Southern planters to make it an object for them to call for a general consultation of our chemists in regard to the matter."

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned

CALIFORNIA.

Calaveras.

SALT SPRING VALLEY.—Cor. of *Citizen*, Dec. 22: The quartz claims in Madam Felix mining district, Salt Spring Valley, and being energetically prospected with the exception of the Royal claim, which has hundreds of tons ready for milling. The owner is negotating with parties for the sale of this mine. The mine has a large amount of quartz assaying from ten to twenty dollars to the ton, with some going up into the hundreds. There is also an indefinite amount of low grade ore with abundance of sulphurets that assay well. The Pine Log and Etta claims are owned by wealthy men of San Joaquin county who have refused $35,000 for their mines. The workmen say that there is very good ore below the 100 level, and that the veins are large. The Hendricks & McCormick mine prospects to the satisfaction of the owners who are mining men of thirty years experience, and have the wit to know a good thing when they see it. The mine adjoins the Royal claim on the south whilst the Hilltop claim adjoins it on the north. There is a large number of veins throughout the district that have been slightly prospected and show some gold; but the group of mines spoken of is embraced within a distance of a mile in length by half a mile in width, showing many veins from less than a ft up to ten in width, which run parallel, with innumerable cross veins, forming a perfect network of quartz, appearing to be a concentration of mineral bearing rock in this particular region that has no resemblance to any found in the valley.

El Dorado.

REID MINE.—Placerville *Democrat*, Dec. 22: F. H. Goyan is pushing work on the Reid mine, and if reports are true he will soon be able to furnish an item that will be interesting to some of our readers that imagine that but little is being done in the mines of our county at present.

Inyo.

POTOSI TUNNEL.—Inyo *Independent*, Dec. 22: The latest advices are that the developments in the Potosi tunnel on the deposit uncovered two months since, are progressing favorably. A recent examination made at the end of the 30 ft drift running on the main lode, disclosed a body of fine ore. An incline shaft has been sunk on the foot wall at this point to a depth of twenty feet, in which the ore continues to show well.

NEW MILL.—W. A. Greenly is preparing to erect a 5-stamp gold mill on Cottonwood Creek, five miles above Piper's Ranch, Fish Lake valley. Mr. P. A. Chalfant is purchasing and shipping material and machinery, and informs us that, unless prevented by stress of weather, he will have the mill in operation early in March.

INITIAL RUN.—The Swansea furnace fired up on its initial run Monday, and ran successfully until Tuesday, when, by the breaking of a pump it was compelled to blow down. This was a most unfortunate accident, for it interfered with what promised to be a most successful run. A few days will repair damages, when the furnace will be again started. During the short run of the furnace 40 bars of bullion were run out.

ELNA.—The Elna furnace has not yet made its repairs, but will in a few days be ready to fire up. A large quantity of ore is ready for smelting, not only from the company's mines, but by shipments made from various points.

Mariposa.

CRANBERRY MINE.—*Gazette*, Dec. 22: This mine, on the Main river, two miles above Ferguson's, has a promising outlook. Craig & Co. have completed a water ditch one and a half miles long, which terminates at the old Rutherford mill site. The ditch is 2½ ft wide at the bottom, and two ft deep. The ditch is expected to afford ample power to run two arastras, which are about ready to start. The mine is about a mile off from the arastra on the mountain above, from which point the ore will probably have to be conveyed by tracks or sleds as the mountain is quite precipitate.

FERGUSON.—This mine has closed its operations for the present. It was leased to Joseph Opie and others for the past year, who have not made a success. The mine has a 10-stamp mill, a compressor, and other valuable machinery, and it is to be regretted that ore sufficient cannot be struck to warrant a continuance of its workings.

QUAIL MINE.—Cor. of Coulterville *Herald*, Dec. 21: They have a splendid chute of 60 ft in the tunnel which continues in the level, showing as large a vein at the end of the tunnel as any other portion of the mine. They are now making a raise to break into the old works above, and are up 60 ft, the vein showing a uniform thickness and all showing free gold to the naked eye. It is the most uniform and pretty lot of ore I have seen for many a year, and I am satisfied from what I have seen of the vein and of the rock on the dump that it will average $20 per ton.

SCANLON'S PLACER CLAIM.—John L. Scanlon has a 2½ inch galvanized wire rope 300 ft in length, spanning the North Fork at the mouth of Gentry's gulch, with a ten-inch iron pipe laid across with 14 ft wall. This will carry the water of said gulch to a bar opposite, that contains from fifteen to twenty acres, all of which will pay well for working. He has made wages for four years by drifting and wheeling the dirt from this bar, and with the facilities he now has can make big wages and it will last him his lifetime. It is one of the best appointed claims in this county.

BUENA VISTA MINE.—The O'Gorman's are pushing the work on their mill. They have been, and still are, retarded in their labors by the lack of carpenters, but are doing extraordinary well under the circumstances. The main building of the mill is already completed and ready for the introduction of the machinery, all of which is now on the premises. The mill will be in full blast in about three weeks.

SWEETWATER MINES.—The Grove Brothers are now running their new 10-stamp mill on ore from the Gordon & Simpson mine, formerly owned and worked by Nat. Harbert. Ferguson & Rice, half owners of the old Early mine, are grading to a mill site on Sweetwater creek, a half mile below the mine, at which place they propose erecting a mill next spring. They have ore enough on the dump to pay for the same. There is about 80 tons of ore on the dump at the Mountain View mine, owned by the same parties, which will pay handsomely for crushing.

Mono.

STANDARD CON.—Bodie *Free Press*, Dec. 18: There were extracted and shipped to the mills 1,366 tons of ore; 1,870 ounces of crude bullion were received and $18,048 shipped to San Francisco.

MAY LUNDY.—Homer *Index*, Dec. 22: Affairs at the May Lundy mine are progressing about as usual, some 20 men being employed underground. Teams and pack mules continue to transport from 13 to 15 tons of ore per day, and all the ore being extracted is of very high grade. The mill is being run day and night up to its full capacity, there still being several hundred tons of ore in the mill yard.

Nevada.

EUREKA MINE.—Grass Valley *Miner*, Dec. 21: The prospecting operations which have been going on upon the old Eureka mine for some months are giving good encouragement. A shaft has been sunk to the depth of 105 ft and a drift run to the northwest 125 ft, where the ledge shows a size of over two ft, and looks well. This drift is entirely in new ground, following a split that went off from the main ledge at the time the mine was worked years ago. There is a probability that a new mine will be opened by means of this prospecting operation within the Eureka location. It is the intention now to put up regular hoisting works over the new shaft.

LITTLE DEER CREEK.—A two ft ledge of very good looking ore has been struck in the Coe claim on Little Deer creek. Ed Moore owns the adjoining property and he has a very rich but not large ledge.

NORTH BLOOMFIELD CO.—The North Bloomfield Co. is now working about 70 men in the hydraulic mine, and have a fine bank of gravel ahead.

Placer.

A '49 STRIKE.—Placer *Herald*, Dec. 22: We learn that a regular '49 strike has been made at Alabama Bar, a few miles above Michigan Bluff, on the south fork of the middle fork of the American river. The mine, in which local parties were formerly interested, is now owned by a San Francisco company. It has paid some for years, though not so much but what when Matt Hazlett sold his interest some time ago at a rate equal to $10,000 for the whole, it was thought he had done well. Now, with a bank of only 6 or 8 ft deep and plenty of free water, they are taking out from 2 to 3 ounces a day to the man. The strike caused some excitement in the neighborhood and induced parties to prospect the river further up, where it was heretofore supposed to be barren. At a point about three miles above Alabama Bar a prospect was got of $9 to seven pans of dirt. This tended to increase the excitement and already the river is staked and claimed for miles, and lots of work and lively times are looked for in that section with the opening of the coming spring.

Plumas

ARCADIAN.—Greenville *Bulletin*, Dec. 15: The Arcadian is developing into a good mine, especially in the lower Sunset. A drift has been run 100 ft upon the ledge in the Sunset; 80 ft of this is 3 ft wide, the last 20 ft is 5 ft wide, and that is the present size of the vein in the face of the drift. All of this distance is in good pay ore. The present depth of backs is 80 ft, but as the drift it running directly into the mountain this depth is constantly and rapidly increasing. Two other chimneys are known to exist upon the ledge; they crop out on the surface some hundreds of ft beyond the present face of the drift. The present prospect for the Arcadian is good.

GREEN MOUNTAIN.—The drift on the ledge at Green Mountain continues to make steady progress. A few weeks more will carry the drift into the Blake chimney and then the amount of ore that may be had will be limited only by the amount that is wanted. The waste rock from the drift has been run out toward the mill, till a way is nearly completed from the mouth of the tunnel, so that when the chimney is reached the ore cars can be loaded where the ore falls and run right into the stamps.

RIVERDALE GRAVEL MINE.—Quincy *National*, Dec. 15: The shaft, after striking the rim, was continued down some 20 ft, and a drift started to the west to tap the channel. This drift has been run just under the channel for 70 ft, and on Monday morning last the gravel broke in at the top. A connection has been made with the drift from the Meylert & Hughes shaft, the water drained off, and the mine is now in a splendid condition for opening. That it will prove extraordinary rich is almost a certainty, as it is the outlet of all the rich channels which made Elizabethtown so famous in the early days of Plumas

San Bernardino.

BISMARCK.—Calico *Print*, Dec. 22: Mr. J. B. Whitfield, foreman, says: "The mine is doing everything that can be expected. We are shipping ten tons of ore each day which averages $100 per ton. We have a body of ore 300 ft wide and 400 ft long. We have been running the mine since the middle of September and are striking richer ore as our property becomes more fully developed. We mill our own ore and realize a reliable profit on every ton shipped. The ore lies in what is known as a blanket ledge. We have worked out to a depth of 14 ft. We have also sunk on the hanging wall of the same body of ore and find our ore richer as we go down."

HUMBUG.—Messrs. Reed Bros. claim for their mine the supremacy; they say of it: "We have just sampled a lot of our ore on the dump and it averages $105 to the ton. We have about 3,000 tons in sight and see no end or bottom to it. Within the past few weeks we had 130 tons milled which yielded us $72 per ton deducting all expenses. This lot was sent to the mill just as we took it from the mine without sorting. Our body of ore contains about one-fifth waste but our ore is rich enough to allow us to do away with sorting and still yield us a handsome profit.".

KEARSARGE.—We have been working the mine for a year past and are now takidg ore that assays $200 per ton. We will ship 40 tons in a few days which consists chiefly of rich chlorides and horn-silver ore. Our mine is doing as well as we could wish for. Our ore lies in a blanket vein and a shaft which we have lately sunk 30 ft fails to show us any bottom to it and we have ore in sight from end to end of our claim."

Sierra.

CHEROKEE CREEK.—Downieville *Tribune*, Dec. 20: J. J. Williams from Brandy City last week exhibited several pieces of rock that showed gold quite plainly. The ledge from whence the rock was taken is on Cherokee creek, near Brandy City. The huge ledge of dark colored rock, resembling bedrock, was passed and repassed for years by Williams without the thought once entering his mind of looking for gold in it. A short time ago, he picked up a piece of the rock and found gold sprinkled over it. Following up this discovery he encountered still better prospects that led him to locate the ledge. A sample sent to San Francisco assayed $159 per ton.

GRAND PRIZE.—The Grand Prize Co. proposes to begin the work of development in their claim shortly. A tunnel will be started that is expected to tap the channel in about 1,500 ft. The Grand Prize ground is located above Poker Flat, and adjoining the Bunker Hill claim. The principal owners reside in this place and Forest City.

BALD MOUNTAIN EXTENSION.—The Bald Mountain Extension Co. cleaned up 66½ ounces of gold Sunday from three days washing of gravel taken from the South Fork ground. The total yield of the week was 119½ ounces from 741 car-loads of gravel washed. The gold is coarse. One piece weighing 5 ounces was picked up last week.

BRANDY CITY.—The new tunnel at the Brandy City mine has been run between 400 and 500 ft. The Burleigh drills will be put at work in a short time. A large crew of men finished repairing the Hoosier flume last week. Everything is now in readiness for doing a big season's work at the mine.

RUBY.—The Ruby Co. is still taking out good pay. The extent of the channel is not yet known, although they have so far opened out that they could put on 20 more workmen if they had water.

Trinity.

A BIG FIND.—*Journal*, Dec 15: Mr. Isola was in town from Deadwood this week told us that he has recently discovered a six-ft ledge lying on the ridge between Frick & Davis and Lambeth's locations, which is destined to be the biggest thing in the State. Tests made of the rock go above $200 to the ton.

WORKING AWAY.—We learn from Supt. Benjamin that work at the head of Canyon Creek ditch will be suspended for the season next Monday, at which time the water will be turned through into Guthrie's mill ditch. The saw-mill is being run night and day.

EASTMAN DISTRICT.—Some time ago Mr. C. Hickey took out about all the good quartz there was in sight in his mine in Eastman district, but he knew where he could strike it again. He went for it a short time ago and the result is that he struck the ledge good sized and going $200 to the ton.

LEWISTON.—Mr. Thos. J. Blakemore, who was in town last week says that one of the workmen called his attention to a 4-inch streak of decomposed quartz about the center of the ledge. Mr. Blakemore took a handful of the "stuff" home with him, and weighing it found there was a little more than 12 ounces. This he pounded up and amalgamated in the mortar and from it obtained $6.60 in gold.

SPLENDID SHOWING.—*Journal*, Dec. 22: The Blakemore mine continues to show splendid prospects. Mr. J. W. Blakemore informs us that they now have 300 tons of rock out most of which will go $100 to the ton and they have 27 tons of selected rock at the lower arastra which will average not less than $250 to the ton. The tunnel is now in a distance of 156 ft—100 ft deep at the shaft—and the pay chute has not been crossed, while the ledge above them varies in width from two to seven ft.

Tuolumne.

LAMPHIER.—Sonora *Democrat*, Dec. 15: Last week it became necessary to shut down the works at the Lamphier mine on account of needed repairs to the boilers. The delay was made longer by the necessity of having to send to San Francisco. In a few days everything will be in readiness and the mill and hoisting works will be started up.

TIOGA AND MOUNT GIBBS.—A gentleman recently from Tioga thinks there will be lively times up there next year. The Great Sierra Co.'s mines are looking well, and the mines at Mount Gibbs, four miles from Tioga, are showing up splendidly. The Deer Lodge and Jefferson, two mines belonging to R. A. Sawyer of Groveland, are said to prospect magnificently. The ledge of the Jefferson is 5½ ft wide, and shows a fine body of high-grade ore. In the Deer Lodge there are four distinct veins, running from 3 to 12 ft in width, and all show good ore, assays going as high as $750 per ton, mostly in silver.

NOTES.—Encouraging news comes from Spring gulch, near Groveland. Drumming brothers and John Marconi have recently struck some good pockets. The Drumming brothers have a deposit of very rich clay, which will pay big if they can get water to wash it. The 8-stamp rotary Sweepstake mill has been completed at the Stockton mine, and has been started up. It runs easily, and does good work crushing so far. Some very rich rock has recently been taken from the mine. The Garibaldi mine has been shut down for the present, the new Huntingdon crusher recently put up not proving successful.

NEVADA.

Washoe District.

SIERRA NEVADA.—*Enterprise*, Dec. 22: On the 3100 level a crosscut has been run east from the station on the east side of the joint winze a distance of 24 ft, following some ore seams that made off in that direction. Now they have started the main northeast drift into Sierra Nevada ground. The first round of holes was fired yesterday.

HALE AND NORCROSS.—Work has been interfered with during the week, on account of the breaking of the rod of the Cornish pump at the Chollar-Norcross-Savage shaft. Enough water found its way up the 2600 drift to flow into the winze and put a stop to work at that point.

UNION CON.—The main south drift on the 3100 level is being pushed 20 ft per week. The drift coming north is making good progress. There is some water coming in at the face.

YELLOW JACKET.—Less than the usual quantity of ore is being extracted, owing to the low stage of water in the Carson river. However, steam power will probably soon be put in use at the Brunswick mill.

COMBINATION SHAFT.—Owing to the breaking of the rod of the Cornish pump, work has been delayed this week, as pending repairs, the water came up on the 2600 level.

IMPERIAL.—Good headway is being made in the main west drift going out to tap the old upper levels of the group of mines commanded by the Imperial shaft. The drift now has but about 100 ft to go to reach the old workings.

ALTA.—The mine has been drained, and the drifts on the 2150 level are now being cleaned out. All the machinery is working well.

OPHIR.—About the usual amount of ore is being extracted from the 150 level. The repairs to the drift and upraise on the 1600 level have been completed. The last shipment of bullion amounted to $21,409.87.

GOULD AND CURRY.—The usual progress is being made in the joint Best and Belcher winze below the 2500 level. Some water is coming in at the bottom.

BEST AND BELCHER.—Good headway is making in the joint Gould and Curry winze below the 2500 level.

MEXICAN.—The repairs to the drift and upraise on the 1600 level are completed. On the 3100 level the work of timbering up and cutting a drain in the north drift is progressing.

UTAH.—Good headway is being made in the north drift on the 1750 level, and it is now out about 80 ft. The ground is favorable.

ANDES.—There have been no special changes in either the north or south drift during the past week.

BELCHER.—Some ore is still being extracted, but the very low stage of water in the Carson river is again interfering with milling.

CROWN POINT.—Less than the usual amount of ore is being extracted, as low stage of water in the Carson river prevents.

CALIFORNIA.—The joint Con. Virginia winze on the 2700 level is going down at the usual rate of speed.

SCORPION.—The west drift on the 500 level continues in the same material as at the last report.

UNION SHAFT.—The work of easing timbers and repairing at the 2300 station goes on as usual.

CON. VIRGINIA.—The joint California winze on the 2700 level is making the usual progress.

OVERMAN.—Are taking out some ore from the ground in the upper levels.

Argentine District.

The Reno *State Journal* of Dec. 15, quotes from the Carson *Index*, as follows: There is no doubt that in the country west of Mount Davidson and between that point and Washoe City, there is a vast mineral region that in time will develop into a splendid system of mines. Were the Sutro tunnel extended westwardly from its present terminus 3 or 4 miles, it would penetrate a wonderful country. Mount Davidson itself is but a monstrous upheaval in the midst of an immense mineral formation which is as extensive and valuable west of that prominent peak as eastwardly. We find that in the hills east of Washoe there are numerous prospectors and many locations of mines. Our exploration was induced by the operations which have been carried on for the last year or two at the so-called Harris mine, three miles east of Washoe City. In fact, the present operations are but a renewal of explorations which took place in those localities years ago, and which failed only through the demand for quartz fully as rich as that which was realized from the "Comstock." The Harris mine is only at a more than usually promising point in the midst of a vast quartz formation which is not even limited by Mount Davidson, four miles to the eastward. Locations and sales of mining ground are constantly going on. The outlook is a most promising one.

RICH ORE.—*Silver State*, Dec. 18: Senator Marker and a man named Harris have discovered, within a few miles of Washoe City, what is believed to be another Comstock. The lead, as far as prospected, carries free gold, and two small sacks of ore from it sold in Virginia City for $1,300.

Belmont District.

BELMONT MINE.—Following is the official report from *Courier*, Dec. 15: From the winze below No. 1 level Laity ground we have started a drift which shows very good ore. Shaft in Moore & Martin ground, now 84 ft deep, shows a two ft ledge standing nearly perpendicular, with good black metal and chlorides. Winze from South Tunnel yielding the usual quantity of black metal. All stopes on 200 level looking splendid, yielding first-class ore. In No. 2 stope we have encountered very rich black sulphides with the ledge widening.

Bullion District

LANDER COUNTY.—Eureka *Sentinel*, Dec. 5: In Bullion district, separated from Campbell district by Indian creek, the mines are well defined and regular veins. The value of the precious metals in the ores runs from $300 to $700 in silver and about $9 in gold. They carry about 10 per cent lead. The principal mines in Bullion are the Lady of the Lake, Ivanhoe, Miner's Home, Radow and Rainbow, owned by the Bullion Mill and Mining Co., a private San Francisco corporation, the stock of which is nearly all owned by L. Radovich and Dr. L. C. Frisbie. This company have lately erected and finished a five-stamp mill. Everything is in perfect running order, turning out bullion from seven tons of ore daily.

Esmeralda District

SILVER PEAK.—*Herald*, Dec. 15. The large mining district surrounding Silver Peak that has so long been idle is to be awakened by the sound of falling stamps soon. John Chiatovich of Silver Peak has leased several of the mines owned by the New York and Silver Peak Mining Co. The 5 stamp, Lodi, Southern Belle mill, will crush the ore, and should developments be made, under this lease the work will be carried on extensively.

ESMERALDA COMMERCIAL CO.—The several

claims of this corporation, on Cat creek and vicinity, are gaining in value. As work on the Bull of the

Paradise District.

PARADISE MINE.—*Silver State*, Dec. 10: A 12-pound chunk of ore from the Paradise Valley mine, brought down by Charles Kemler, may be seen at this office. It is said by Mr. Kemler and others who have been in the mine, to be an average sample of a body of ore 5 ft wide in the Paradise mine, and it will assay over $3,000 to the ton. All who have seen this ore body say it is the largest and richest ever found in Paradise mines.

Peavine District.

GOLDEN FLEECE.—Captain Griffin informs the Reno *Gazette*, Dec. 14, that the Golden Fleece, which, owing to a break in the tunnel, was obliged to run around it for a considerable distance, has now such prospects as to render the stockholders very sanguine, and he himself feels sure that Peavine will turn out one of the finest mining districts in the State. Woods progresses, the ledge increases in size and richness. Everything in and about this mine is being placed in first class condition to insure profitable developments this winter. The mill will be overhauled and put in complete order, preparatory to starting up on ore from the mine. This week while grading a place upon which the boarding house is to be erected, a hidden ledge, 4 ft wide, rich in free gold, was uncovered.

Ploche District.

MENDHA MINE. *Record*, Dec. 15: About 90 ft from the surface is where the late body of ore was discovered. There were several miners extracting ore. Of course it is impossible to guess as to the extent of the ore body, but, where ore had been extracted, it showed the vein to be fully 13 ft in width. The men keep three teams hauling ore. The ore is a carbonate, with a goodly quantity of bright galena sprinkled through it. In sinking the shaft, this body of ore was cut through, and how it happened not to have been observed does appear strange, for we noticed on the opposite side of the shaft the same ore with bright galena all through it. The ore that has been shipped to the furnace from this mine up to December 1st averaged $126 in silver.

DAY MINE. The Day Co. recently purchased the old Hamburg mine, and have three men employed prospecting it. In early days the mine yielded some very fair ore. There is no reason why it should not do the same again to-day, and with a little prospecting, like the Mendha, it may again be made to give up its precious metal. The furnace at Bristol is undergoing a thorough overhauling so that when it starts running there will be no cause for stopping. Foreman Richard Walsh is engaged in relining it and making all necessary repairs. The bins are all filled with coal and the teams are hauling ore. Everything is being got in the best condition for a long and steady run. The furnace will start up about the first of next month.

KINGFISHER.—The ore is developing grandly. The ore recently encountered on the tunnel level is now six ft in width. The last assays had, made by J. C. Lynch, of the ore on the tunnel level showed 48 per cent lead and $57 in silver. Pointers all indicate that an extensive body of ore will be developed soon. The sinking of the shaft is being pushed ahead, and ore continues at the bottom.

Pyramid District.

A BRICK.—Reno *Gazette*, Dec. 18: Chamberlain had a chunk of purple ore from Pyramid lying on his counter last week weighing just 18 pounds. He got Thomas Price to reduce it, and this morning brought home a red brick containing 74 cents in gold, 56 cents in silver and enough copper to make it weigh 73 ounces. That makes the ore worth $151 in gold and silver, and $100 in copper per ton.

Tuscarora District.

ARGENTA.—*Times Review*, Dec. 18: South cross-cut on the 400 level is in 19 ft.

GRAND PRIZE.—South drift on the 400 level in 206 ft. Stopes are producing usual amount of ore. Shipped $7,000, for the week.

BELLE ISLE.—Work underground for the past five days has been suspended, on account of the repairs being made at the main shaft.

NORTH BELLE ISLE. The usual progress has been made with the crosscuts on the 300 level. No change to note in the stopes. Average battery assay, $162 per ton.

ELKO CON.—The main crosscut on the 200 level has been extended 12 ft, being now in a distance of 42 ft.

INDEPENDENCE.—Main drift north has been extended 12 ft, total, 928. No. 4 crosscut advanced 17 ft, total length, 70 ft. No. 1 crosscut extended 31 ft, total, 168 ft.

NAVAJO.—During the past five days the repairs in the hoisting engine has necessitated the suspension of work underground. The repairs will be completed and work resumed to-day.

CENTRAL CON.—Have reached solid ground. Distance to bottom of old shaft and sump, 79 ft. Formation has changed from granite to soft porphyry in the last two days, and is splendid working ground.

ARIZONA.

CASA GRANDE COPPER MINING CO.—Globe *Chronicle*, Dec. 15: The Copperosity group of mines have been sold to W. B. Hellings, who represented San Francisco parties, for the sum of $57,000. They are 35 miles due south of Casa Grande. The group consists of the Copperosity, Welshman, Little Chief and Copper Giant, all being on the same vein. The four claims take in 5,200 in length by the usual width of 900 ft. Ore crops continuously for 4,500 ft on the vein. Its immense size and the enormous quantity of ore in sight stamps it as the mother vein of the district. From the bottom of a 50 ft shaft, on the Welshman, a crosscut has been run 40 ft, passing through 27 ft of ore that will average 14 per cent copper. This is the average result of over 50 assays made by Mr. Hellings. Mr. Hellings accepts the superintendency from the purchasers, who will incorporate in San Francisco as the "Casa Grande Copper Mining Co."

CENTENNIAL SWEPT AWAY.—*Miner*, Dec. 14: Robert Stein of Centennial Mining Camp, which is south of Cullen's Well on the Erenberg road, writes James Daly that on the 5th inst. a body of water came through the valley, caused by heavy rains, washing away the entire camp, those living there escaping by climbing into the mesquit trees. Ores were being worked by arastra process, and some of the parties were about to clean up, but the pulp was swept away by the river of water, which so unexpectedly put in an appearance.

TOMBSTONE.—*Epitaph*, Dec. 16: Tombstone has passed its turning point. Work in our large mines below the water level, has been commenced, which, with the large reserves of ore in the upper level will materially increase our bullion output. The question of handling the water is solved, the Contention pumps alone, being sufficient to drain the mine, at present running at less than half their full capacity.

CONTENTION.—All the machinery works admirably. Here everything went from the first like clockwork, and a stranger, if present at the starting last Monday, would never have known if not told so, that it was the first trial of the heaviest piece of machinery ever put up in Arizona. The mine was perfectly drained in about five hours, after which the pumps were run at less than one-half their speed.

OLD DOMINION.—*Silver Belt*, Dec. 15: Old Dominion shipments for the week: Bars of copper 437, pounds 127,405. A new thirty ton smelter has just been received and the company will soon have three furnaces in operation. They have shipped 50 tons of ore to Pope, Cole & Co., Baltimore, to test the petroleum furnace at their works.

COLORADO.

EMPIRE.—Georgetown *Miner*, Dec. 15: George Barrett is fitting up the old Knickerbocker mill in good shape and will soon start up with 20 stamps. D. S. Lambert & Co., fixing up the Bay State mill, at the forks of Lyon gulch—16 stamps—will start in 2 weeks on their own quartz. The Pioneer mill and mine at North Empire is liable to be started up soon by Col. McLane. Before one knows it the mill will be pounding away. There is still some talk of the Neath mine starting up between now and spring, with a new engine, pump, hoisting works, etc. Our little Chilian mill down at the station, is still rolling away successfully. The New York and Colorado company's mill, 3 miles above Empire on the Middle Park wagon road, will start up in a few days with its 50 stamps and 10 Frue vanners. As soon as the mills start up the mines will start, then come the gold retorts of old. The Cashier, the Empire City, the Americus, the Windsor, the New Discovery, Neath and other mines, on Covode mountain, the Tenth Legion, Pioneer, Tenth Legion Extension, Grand View, Colorado State, Murphey, Gold King and others, on Silver mountain, all known to be good lodes, will start up with the mills.

LULU.—Gillette & Co. have run 350 ft on the Carbonate lode. There are also shafts sunk at intervals so that the total workings amount to 500 ft. They have a fine body of quartz, thickly interspersed with galena and yellow copper. Specimen assays have run as high as 300 ounces.

NOTES.—*Courier*, Dec. 13: The Silver Link mine, Sherman mountain, is yielding some good ore, which mill-runs, first-class, between 300 and 400 ounces silver per ton. Thomas & Matthews, lessees on the Vulcan, have a streak of ore from 6 to 8 inches wide, which mills, in one class, 100 ounces silver per ton. Conway & Co., lessees on the Little Emma, on Democrat mountain, had a mill run this week of over a ton of first-class ore, which run 1200 ounces silver per ton. About 7 tons of second-class run 300 ounces. Wm. Lynn, of Silver Plume, has disposed of a claim situated in Lincoln district, to Mr. Mackey for $2,000. A 75 ft shaft has been sunk on the claim, from which ore has been taken that mills over 2,000 ounces. The Burleigh Tunnel Co. intends driving the tunnel ahead soon. It is now in a distance of over 2300 ft, and within 900 ft of 7:30 group of veins, the cutting of which will no doubt open up a large and rich body of ore.

IDAHO.

ATLANTA.—Wood River *Times*, Dec. 12: The Last Chance mine at Atlanta, the property of the Atlanta Hill Gold Mining and Milling Company of New York, has closed down. The closing was a surprise to everybody. The mine is in better condition than it has ever been, large amounts of rich ore being in sight. The Supt. can give no reasons for this move. He laid in six or eight thousand dollars' worth of supplies, and large amounts of timber, lagging, wood, etc., engaged men to work all winter, and made every preparation for active work. All this was done on the company's orders. This is very hard on the camp, the men who were engaged having moved up the hill to the mine, laid in their winter's supply of provisions, wood, etc., all at considerable expense. The Co. has not yet paid off for October, and this, in the face of the success the Co. have had under present local management, looks very bad. The mine has been put in excellent condition and nearly $30,000 in gold bullion has been shipped to the New York office—all of which is largely in excess of the expense.

SILVER BULLION.—Ketchum *Keystone*, Dec. 15: Mr. Popham came into the office yesterday with a handsome chunk of ore from the Silver Bullion. It consists of chlorides and black carbonates, and assays 256 ounces. The vein in the Silver Bullion averages 14 inches in width from one end of the main tunnel to the other, and the ore is chiefly such as shown us. The outlook is fine.

NOTES.—The Independence, worked by Messrs. Ried Bros. and Johnson, is looking well. Recent samples of the ore taken from the breast give an assay value of 60 ounces for the very lowest grade, and over 200 ounces for the best. The Elkhorn employs two four-horse teams hauling ore to the Philadelphia smelters. The Ontario mine is looking splended. Over two ft of high grade galena is followed in the main works. The Blue Cloud group, owned by Wm. Harris, will be put on the market this winter. The Noonday tunnel is driving away at a lively rate. The Imperial has laid in winter supplies. Gillette & Co. are working the Ida Harland. About eight inches of solid galena has been found, and the claim is said to be looking immense. Four men are at work on the Independence and two on the Silver Bullion.

FOREST KING.—*World*, Dec. 11: Jas. Moriarty, Jr., one of the owners of the Forest King mine, informs us that they have run 36 ft into the ledge since tapping it and are now, he thinks, close to the footwall. They have a fine body of ore, and the mine makes a good deal better showing at this depth—320 ft—than in the old works above. The ledge matter is solid and firm, and the tunnel has not been timbered beyond the point where the ledge was tapped. Work will go on in the mine all winter. The Forest King is now opened up in good shape. We have no doubts that this mine will turn out big piles of the yellow metal and enter the list as one of the rich mines of Idaho.

COEUR D'ALENE.—Bodie *Free Press*, Dec. 19: Intelligence was received here yesterday from a trustworthy source, that the Coeur d'Alene mines will turn out to be really good, though perhaps they will not come up to the wild representations of some. The writer says the village of Hayes City consists of 40 or 50 log cabins and contains about 250 people. There was 2½ ft of snow on the ground when he left on November 25th. Mining was still carried on to some extent and more or less work would be done the entire winter. On Pritchard creek above the town, good claims have been discovered for ten miles. Some good prospects have also been discovered in 5 or 6 side gulches and sales have been made at prices ranging from $100 to $800 per claim.

Several quartz claims have been located which show high-grade ore, but very little work has been done on them on account of the deep snow which renders it impossible now to get into the mountains to prospect for quartz. Regarding the placers, he says the gulch is very wide and flat, running from 40 to 80 rods wide and having a fall of from 2½ to 3 ft to the 100 ft, the entire flat being heavily timbered. It is impossible to say how much dust has been taken out. The claims were first taken up by Palouse farmers; but few miners came in until late. The snow is deep, timber thick and the river must be crossed over thirty times between the mission and the mines.

The writer adds: "It will be a big camp. If a main pay channel is developed, in my opinion, it will be a better camp than Alder gulch was in its palmiest days. It prospects as well or better on the sides than Alder gulch did, and the gold is coarser. There are 14 miles of the gulch, besides the side gulches, affording ground enough to support a large camp. The bedrock is slate, with the gold in the crevices, and it will be hard bedrock to clean. There will be a grand hegira in the spring from all sections of the coast, and from my experiments with placer excitements, it would not surprise me to see 50,000 people in the diggings next season. Grub was getting a little scarce. About the most plentiful and the cheapest article was whisky, all the stores keeping it at two bits a drink. The restaurants furnish meals consisting of bacon and beans with coffee in a tin cup at $1 a meal."

The Walla Walla *Union* of Dec. 8 says: C. C. McCoy, of this city, has made all the necessary arrangements to start within a few weeks a well equipped line of daily stages between Rathdrum on the line of the Northern Pacific and the Coeur d'Alene mines via the lake. Mr. McCoy has already received the contract for carrying the mails and he has made arrangements with the O. R. & N. and N. P. companies whereby through tickets can be purchased to the mines. The stages will be thorough-brace coaches with four and six horse stock attached. The route chosen will give passengers a stage ride of a few miles to Fort Coeur d'Alene, from thence a steamer will convey passengers to the head of the lake when coaches will be again used. It is by far the easiest and shortest route and from the reports of the Pacific coast press we are of the opinion that Mr. McCoy will have to put on a double daily to meet the requirements of travel before spring closes.

The Kootenai *Courier*, of Rattledrum, Idaho, says: For months it has been known positively that gold and silver in almost inexhaustible stores are to be seen in the Coeur d'Alene gold fields. That the average yield of the placers per day to the man is from two to five ounces of gold is not controverted. Not less than 3,000 miners have visited this district during the past six months, and there is but one opinion—"rich beyond a shadow of doubt." This is not mere idle rumor, but the writer of his own knowledge—having made two trips to the gold fields—would be willing to make affidavit that at least three claims yielded not less than two and a half ounces per day to the man; and farther, that two of these claims were employing from seven to eleven men.

MORE.—Wood River *Times*, Dec. 12: H. W. Stoddard, left here six weeks ago for the Coeur d'Alene region, and returned this morning. From Hailey Mr. Stoddard traveled by rail to Rathdrum, on the Northern Pacific; cost of fare, $85, besides meals; from Rathdrum it costs $1.50 on the stage to Lake Coeur d'Alene, and $2 to cross the lake on the government steamer, which was still running. To the north fork of the Coeur d'Alene river is 60 miles. To reach this point the river has to be forded 25 times, and the water in the river is so high that the animals must swim at every crossing. Mr. Stoddard thinks that it will be a huge mining country; and he will return in February next, and attempt everything to get in. He is an expert snowshoer, and, as he knows the road, expects to get through all right. Transportation facilities are out of the question, as not even Indians can travel in that country in winter. But he wants it distinctly understood that he does not deem it advisable for anyone to attempt to get in before next April.

MONTANA.

BELL MINE.—*Inter-Mountain*, Dec. 17: A few days ago a magnificent ore body was penetrated, the estimated extent of which has been confirmed by subsequent exploration. Associated with a wide vein of second and third class ore, an ore body of high grade has been discovered. Its width is reliably reported to be 8 ft. It occurs as a massive copper sulphide assaying from 50 to 76 per cent, much of it being a pure copper glance. Thus far the silver assays have averaged $65, though samples of ore of wonderful grade in silver have been put through the assay furnace. It will require several days yet to determine the full extent of the strike.

MOULTON.—*Inter-Mountain*, Dec. 15: A very promising body of rich ore has been discovered on the 400 ft south vein, 700 ft west of the main crosscut. The ore was followed by a winze from the 300 almost to the 400 ft level. The new strike, in places, is over 4 ft wide and of excellent grade. From the 400 ft level a winze has been started with the view of ascertaining if it is continuous to the level below. At present the exact nature and extent of the strike is not known.

GLOSTER.—Helena *Independent*, Dec. 13: The new 60-stamp pan-mill (twenty-four pans, twelve settlers, and forty-eight tanks) is ready to run and has probably already started up, although at the time our informant left Gloster the weather was too cold to commence operations, as there was so much new machinery that to start it up in very cold weather might result in dangerous breakages. With the almost unlimited quantity of ore at command in the Gloster, and appliances that will save the gold, and also the steadily increasing percentage of silver, we shall expect to hear of a magnificent output of the precious metals from this splendidly equipped plant in the near future.

NOTES. Butte *Miner*, Dec. 12: The drift from the Alice 800 ft level has advanced west 200 ft and east 100 ft on the ledge, and some good ore is being stoped out from both. The Pollack, which is worked under a lease by Patsey, Johnny and Dennis Clark, is turning out a big mine. The tunnel has advanced 250 ft under the hill and is in good ore. Sixteen men are employed in the stopes, which now show 80 ft of back. The ore taken out is high grade, the last two shipments returning 102 and 107 ounces respectively. Clark's Fraction is looking well in the drift, which has been run from the Alice 300 ft. The drift is in 2 to 3 ft of good pay ore. About 5 tons of 100 ounce rock is taken out per day. The Clark's Colusa shaft is down 210 ft, at which point a station has been cut in the large body of ore at the bottom of the shaft and a station set has been put in. Drifting on the ledge will be commenced to-morrow. The Neptune stopes are looking well, and from six to seven tons of 60 and 70 ounce ore are raised daily.

NEW MEXICO

LAS VEZAS PLACERS.—*Gazette*, Dec. 12: In excavating for the foundation of the new Court House, two men found "the color," and staked out claims. There is every probability that these men, whose names are John Gilky and Charles D. Smith, secured some valuable property. A placer digging that will even yield two cents a pan, situated as the above properties are, is the biggest gold strike that has ever been made in this section. With an abundance of gravel from ten to thirty ft to bedrock, water easy of access and cheap lumber, it almost equals the California discoveries of '49. In case the fortunate owners should desire to put in hydraulic works they can do so at a small expense from the city water works. The pressure that can be obtained is one hundred and forty-five pounds to the square inch, which is greater than is generally used. To-day will establish, beyond a doubt, the true value of the new find, and if it is half as rich as represented it means a veritable boom for the city of Las Vegas. Placer gold in paying quantities would increase our population to twenty-five thousand within two months. Our merchants would sell every dollar of their stocks of goods before they could receive fresh supplies from the east. The city would be flooded with strangers, the hotels crowded, livery men would make fortunes and real estate men grin.

SIERRA GRANDE.—Las Cruces *Republican*, Dec. 15: The ore taken from the Sierra Grande comprises galena, lead carbonates, native and horn silver, and now and then black sulphurets of silver. Excavations have been made, shaft sunk and tunnels run along the southwestern slope of the hill for a distance of about 800 ft from east to west, and from 250 to 300 ft from north to south, showing everywhere a mass of good milling ore, much of which is high grade—by which is meant ore running from $100 to $800 and more to the ton. One piece of ore taken from the mine was shown which runs $20,580 to the ton. This ore-body has been penetrated by shafts sunk from 10 to 22 ft deep, without determining its thickness, as the bottom of the ore-bed has nowhere been found.

FLEMING.—Southwest *Sentinel*, Dec. 12: The Fleming mill started up again the latter part of last week, after being closed down for several days to allow a "clean up" to be made. It will run steadily from now on. There are at least 350 tons of ore on hand at the mill and several hundred more on the dump at the mine. The mine is looking better than it ever has. The "clean up" made at the mill last week far exceeded the expectations of the proprietors. The amount of bullion obtained was seven bars, aggregating nearly $12,000. This is the second "clean up" of the mill since it began running, about six weeks ago.

MODOC.—The Modoc mine, in Bald Mountain district, is showing up well. On the surface the vein was but four inches wide and not very rich, but at a depth of 14 ft the vein has widened to 24 inches and the ore is very high grade. We were shown some specimens from there yesterday that were literally filled with horn silver.

GOLDEN RULE.—A strike of great importance was made at the Golden Rule mine, Dragoon summit, on Monday. At the deepest point in the mine, in the drift running west, a seven ft ledge of the usual grade ore was opened up. This proves beyond a preadventure that the mineral body increases as depth is attained in this mine at least. The stockholders are jubilant.

UTAH.

NOTES.—Park *Mining Record*, Dec. 15: The Shenandoah mine, in Snake Creek district, will next week commence ore shipments which, should the weather prove favorable, will be kept up all winter. The Silver Key is working a force of 8 men, and the mine is looking well. Ore shipments will not be resumed for some time, owing to the large amount of dead work which has to be done. N. C. Springer has taken charge of the Keystone, and has put to work a force of 12 men in running tunnels. The vein in the Creole has been cut and sinking on it commenced. The Creole is the nearest ore-producing property in the camp, and can handle its ores at a very slight expense. The weather in this section continues clear and cold, and the ground is almost entirely free from snow, making the best winter for several years past for prospecting. We have had presented us by F. W. Hayt, manager, the prospectus of the Southern Tier Mining Co., whose mines are located in Snake Creek district, Wasatch county. It shows the prospects very flattering. The capital is $2,000,000—100,000 shares of a par value of $20 each.

For Mining Shareholders' Directory, Stock Reports, etc., see page 420.

Collecting Flue Dust—No. 6.

The sixth campaign lasted 314 days. During this time the ore treated contained 6,247,605 kilos. of lead. The seventh campaign lasted only 200 days, and the ore treated contained 4,245,303.21 kilos. of lead.

There was a very large increase in the quantity of dust collected, except in Sections V, VI, VIII, X, and XIV, where the quantities are in round numbers 26,000, 13,000, 3,000, 2,500 kilos. less. The total quantity collected is, however, greater than in the sixth campaign, and almost in direct proportion to the increase of wall surface. But in every case where there is a diminution, except in Section XIV, there is an increase in the quantity of lead per 1,000 kilograms. The quantity of lead per square meter of wall surface is less in Sections V, VI, and VIII, and slightly more in Sections X and XIV. The total quantity is, however, enough more to justify close attention.

It would naturally have been thought best, as soon as the practicability of this method of using iron plates had been proved, to have hung the whole flue full of them; but as no sufficient data had been collected as to how far the draft would be affected by it, it was done very gradually. Before the seventh campaign, in August, 1881, 1,140 square meters were put in. In March, 1882, before the eighth campaign, 10,450.86; and after the eighth campaign, in September, 1882, 13,055.35 more; so that up to this time there were 24,471.60 square meters of sheet-iron plates hung in the flue. An accident, which happened in the summer of 1882, made it necessary to do away with the upper part of the condensing-chamber building, which includes Sections X, XI, XIV, and XV, Figs. 14 and 15, as the roof was no longer tight. The flue itself had then 18,060.01 square meters of wall surface; this, with the 24,471.60 square meters of sheets, made 42,531.61 square meters of available condensing surface. The sheet-iron plates introduced cost 18,108.98 marks. If this amount of surface had been introduced by means of a masonry canal, such as is shown in Fig. 9, the square meter of which costs at least 11.71 marks, it would have amounted to 286,562.44 marks. There was thus saved by the use of the iron plates a sum of 268,483.46 marks.

It was a matter of some interest to ascertain whether the draft had not been diminished by the

Enormous Friction Surface

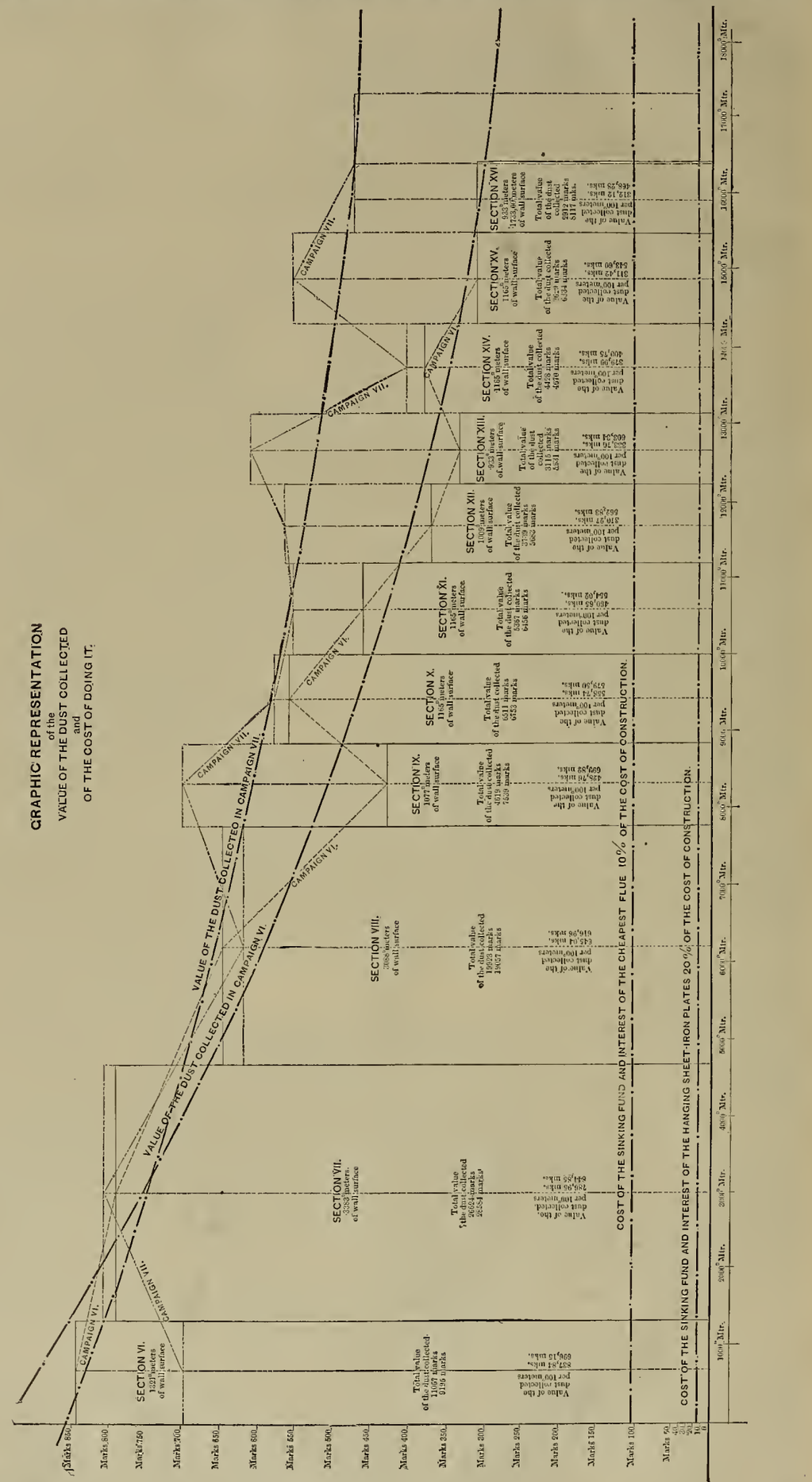
Which has been added in the flue by the very large amount of surface introduced into it. As the entire flue during the three weeks that the works were obliged to stop for these repairs, was very much cooled, it was found that at the time the works were put into blast again, there was such a very weak draft that it was necessary to put a fire at the bottom of the chimney on the top of the hill. After three days' use of it the draft was sufficiently strong to make it no longer necessary. The damper in the chimney is now not entirely open. Little by little it will be brought back to its former angle. With regard to the temperature in the flues, the gases escaping from the chimney in the normal working of the establishment have a temperature of between 60° and 70°. With regard to the quantity of lead contained in the dust, setting it on fire undoubtedly diminishes the quantity more or less; but that upon the arch, which afterward falls to the ground, does not contain as much as that which collects on the bottom of itself. Taking the sample for the assay is on this account very difficult, and mistakes are very apt to be made, when the fact of the dust collecting in layers of variable richness is not taken into account. The assays taken at the end of the seventh campaign were in any case more nearly correct than those taken at the end of the sixth.

The Sheet-iron Plates

Which have been hung have lasted extremely well. Not one of them has as yet been damaged, and it seems more than likely that they will last at least five years. The only danger appears to be from dampness, which would cause them to rust, and this can only be avoided by confining the places in the flue where they are hung to such a distance from the furnaces that it is certain that all the dampness will have previously been condensed out of the gases, and by properly draining the surface so that no moisture can collect in it from the outside. By this system it is possible to collect the whole of the dust in a small part of the flue near the works, and thus save a large amount of transportation of the material collected, while at the same time diminishing by so much the loss consequent on carrying it. This loss by transportation will, of course, be reduced to a minimum when the dust is agglomerated.

Cleaning the flue necessitates, at certain intervals, a stoppage of the works, so that only those places are frequently cleaned in which the sheet-iron hangs, while the flue itself is cleaned at longer intervals. In those places where a stoppage of the works is impossible, two flues filled with sheet-iron plates can be built side by side in the most convenient situation, so that either one may be connected or cut off entirely from the main flue, according as they have been cleaned or are to be cleaned, without stopping or even hindering the work of the furnace at all.

During the seventh campaign no change in the quantity of wall surface was made except in Section 16, where the wall surface was increased from 933 square meters to 1,733 square meters. It is very remarkable that while between these two campaigns no change in the quantity of wall surface has been made except in Section XVI, all the weights and values have been altered by this single change; and that while the flue has been made very much shorter by the cutting out of the condensation chambers X and Y, the wall surface has been so much increased by the addition of sheet iron plates that, with the exception of Sections VI and VIII the value has in every section been increased, while the total value has been very largely increased, which is shown by the curve representing Section XVI in the seventh campaign, being very much higher than that of Section XVI in the sixth campaign, making the total value of the dust collected in this section more than three times what it was in the former campaign, while the surface has not been quite doubled. This shows beyond doubt that the quantity of material collected is proportional to the extent of wall surface, and that the cubical contents of the flue itself is of importance only as it allows of a maximum amount of surface in the shape of plates being introduced within it. It is also to be remarked that while the curve in the seventh campaign is much flatter it commenced in Section VI with less value, and there seems, therefore, no doubt whatever that this method which is not only



cheap, so far as the installation is concerned, is also by far the most effective of any which has yet been devised for the collection of flue-dust, and notably for the condensation of the volatilized material. It is to be noticed that there are three separate causes which will make the curve flatter. The first of these is the decrease in value, owing to the complete separation of the particles mechanically carried off; the second is the decrease in value, owing to the reduction in temperature; and third, the decrease in the value of the gases, owing to the separation of the metallic particles held in suspension.

As is Shown by the Results.

The first cause, that is the separation of the particles carried off mechanically, acts within a very short distance from the furnace, so that by the proper construction of the condensing plates, nearly the whole of the ore particles will be separated from the gases, not far from the furnaces themselves. There will remain then in the gases only the volatilized metals. Some of the causes of the difficulty of the separation of them from the gases have been already discussed. It appears, however, that the curve might easily become a straight line if it were possible by the introduction of an infinite quantity of surface to condense the whole of the dust. It would seem from the discussion of these two curves that the influence of the reduction of temperature was not as great as it appeared to have been from the experiments made in the sixth campaign. It will, however, probably be found expedient on account of repairs to still further disengage the sides of the flue, both for convenience of repairs and convenience of access.

The Square Meter of Wall Surface,

Made of new sheet iron, No. 22, including the cost of erection, will not cost more than 0.75 marks. One hundred square meters would, therefore, cost 75 marks. In making up the cost of these two methods of getting surface as is shown upon Plate III, 10 per cent of the cost of construction has been charged for the sinking fund of the masonry walls, while for the sheet-iron surface, 20 per cent, which is a very large charge, is made. The yearly charge, then for the sinking fund for the 100 square meters of masonry surface, would be 102 marks, while for the surface obtained by hanging in the sheet-iron plates it would only be 15 marks. The difference between the two is shown very decidedly in the lines representing the cost, Plate III. From the experiments which have already been made since the introduction of these sheet-iron plates in the flues, 20 per cent seems to be a very exorbitant charge, although made very high purposely, in order to make the most disadvantageous comparison between the two systems. No perceptible alteration or wear has been shown after a use of five years, so that if less than 20 per cent is charged, the line would go still lower than it now does, and it would seem to be the natural conclusion that the cheapest method would be to build short, large flues in which the maximum of wall surface was obtained by the intercalation of these plates. All the experiments made up to the present time fully justify the conclusion, that not only is this the most economical method of saving a quantity of material which has hitherto gone to profit and loss, because it was supposed to be impossible to save it, but that it is also possible to reduce very largely the cost of the works by increasing the wall surface indefinitely at a very cheap rate. The most remarkable fact relating to these experiments is this, that by almost doubling the wall surface in the last section of the flue which is furthest removed from the works, where there was no probability that any material mechanically carried off by the gas would be still retained suspended in it, there is such a large amount of value obtained from the dust. This can only be attributed to the fact that metallic material which is volatilized, and which is collected with such great difficulty, has been carried to that point and condensed there, and that without this increase of wall surface this large amount would have gone up the chimney and been entirely lost. It seems, therefore, that not only in all works where the flue dust contains value should especial attention be given to collecting it, but that the quantity of metal which is actually volatilized, merits special attention.

When the values which represent the different sinking funds for the year are transferred to Plate III, and compared with the curve which shows the value of the dust collected in the different divisions of the flue, and these data are also compared with the very great value of the flue dust collected, it is a matter of surprise that the collection of flue dust in metallurgical works does not appear to have attracted more special interest than it has done, if only on account of pecuniary importance.

THE California Wire Works of this city report their business as follows: Capital invested, $500,000; paid for labor in past year, $120,000; average number of hands employed over 16 years of age, 100; under 15 years of age, 15; average day's wages for skilled labor, $3; for ordinary labor, $2. In the establishment no Chinese are employed.

ARTHUR MACY, a graduate of Columbia School of Mines, New York, has been appointed Superintendent of the Silver King Mine, of Arizona.

USEFUL INFORMATION.

The Tanning of Tissues.

According to the *Moniteur des Fils et Tissus*, a Belgian inventor, M. Piron, has devised a process which renders tissues waterproof and capable of resisting decomposition without impairing their softness and appearance, or greatly increasing their weight. The inventor first collected specimens of tissues which had been subjected to various processes of a preservative character, and afterward exposed to the effects which he proposes to render uninjurious. The head-bands found on Egyptian mummies having been impregnated with resinous substances, M. Piron concluded that the vegetable kingdom was the most likely division of nature in which to seek the needful substance, and he claims to have discovered it in a product obtained from the bark of the birch tree, which is known to be used in the manufacture of Russia leather. The distillation of the fine white bark produces a light oil, about one-quarter of which is formed by that peculiar kind which communicates to Russia leather its particular odor. The green birch tar is obtained from the Kostroma district, and forms, in conjunction with alcohol, a solution of great fluidity, but when dried and resinified it resists the action of alcohol and unites itself to the most brilliant colors. These properties allow of its not only filling the capillary vessels of tissues, but also coating them with a substance of great elasticity, not affected by acids or the action of sea water, and capable of supporting changes of temperature. Its density is said to be small, and it consequently increases but slightly the weight of the tissues, which it renders impermeable. Materials thus treated can be folded without the surface splitting in any way. This substance, while being economical, fulfills all the conditions of such a preparation. Its aromatic odor serves to keep away insects. No microscopic vegetation can take place, as neither water nor air can penetrate into the interior of the fibers.

It is stated that M. Piron's invention can be applied to all tissues, etc., made from vegetable substances, such as sail-cloth, ropes and cordages, wagon coverings, and other articles.

Imitating Expensive Leather.

Transforming cheap leathers to imitate the more expensive grades by giving them the outward appearance of superior quality, has become an industry of some importance. This is accomplished by a process that is simple, economical and effective, consisting of two principal operations.

The leather which it is desired to imitate is thoroughly cleaned and carefully coated with graphite, the work being similar to that necessary in preparing a smaller article for electroplating. It is then placed in a copper bath, the tank of which is large enough to easily receive a skin of any size. A dynamo-electric machine, generating a powerful current, furnishes the electricity. The copper is deposited upon the coated surface of the hide to a thickness of from one-sixteenth to one-eighth of an inch. The plate thus formed reproduces, but reversed, every mark and minute vein of the leather, so that a print taken from it is an exact copy of the original in every detail.

A hide of cheap leather is laid upon the bed of a machine much resembling the ordinary iron planer. Extending across the bed is a large iron roll journaled at either end in boxes which slide between two vertical standards. Strong screw bolts regulate the distance between the bed and the bottom of the roll. The copper plate is laid upon the leather, and two or three thicknesses of felt cloth placed on the copper. By the aid of long levers the bolts are screwed down until the iron roll bears upon the copper and leather with a pressure of many tons. The bed being moved forward until all the plate has passed under the roll, the hide is removed and is found to have been raised, in looks, to grain leather of the finest grade, or to alligator, as the case may be. The copper plate, being extremely hard, will print many hides. In some instances the plates are engraved, but as this method is more expensive, and the reproduction not so faultless, it is but seldom resorted to.—*Scientific American.*

INFLUENCE OF QUALITY OF SEED UPON THE CROP.—One of the most important conditions of a successful vegetation experiment is uniformity in the seed used. With this in mind, Hellriegel has investigated the effect of variations in the absolute weight, and in the specific gravity of seeds upon the growth of the resulting plants. He finds that, of seeds (of barley) having the same specific gravity, the heavier seeds produced at first more vigorous plants than the lighter. As the plants continue to grow in good soil, the differences gradually diminished, until, at the time of harvest, they had entirely disappeared. When the plants grew in poor soil, the effect of differences in the seed was more lasting, and even affected the total weight of the crop. Differences of specific gravity in seeds of the same weight produced no recognizable effect upon the crop. The stage of ripeness of the seeds affected the development of the plants in the same direction as it did the absolute weight of the seeds; the riper seeds being heavier, and producing the most vigorous plants, and the differences being most manifest on a poor soil. Essentially the same results were obtained in experiments with potatoes. The attempt was also made to raise potatoes of greater or of less specific gravity, by selection; the heaviest or lightest being continually selected for seed. The experiment was continued through three seasons, with a negative result.

PURIFICATION OF SEWAGE.—Experimental trials of the Andrews-Parker process for deodorizing and purifying the sewage of London have been in operation since last May. The 90,000,000 of gallons daily and nightly flows into subterranean reservoirs located beyond Beckton. By the action of water and repeated pumping before the last station is reached all the fecal matter in the sewage is reduced to a liquid having a grayish-black appearance and an extremely offensive odor. The sewage, after having been drawn into a tank, is subjected to a powerful stream of water, under heavy pressure, charged with ground clay, caustic soda, hydrochloric acid and sulphate of iron. The mixture is then turned into large tanks, where it is allowed to remain until the action of the precipitates has thrown all the sediment to the bottom, when the liquid is drawn off into the Thames, it being a pure, colorless and odorless water. The sediment is kiln dried and pulverized, and makes a fertilizer which chemical analysis has shown to contain a large proportion of ammonia and phosphates, and to be of much commercial value.

THINGS TO TREASURE.—Accumulations of knowledge and experience of the most valuable kind are the result of little bits of knowledge and experience carefully treasured up. Those who learn nothing or accumulate nothing in life are set down as failures, because they have neglected little things. They may themselves consider that the world has gone against them; but, in fact, they have been their own enemies. There has long been a popular belief in good luck, but, like many other notions, it is gradually giving way. The conviction is extending that diligence is the mother of good luck; in other words, that a man's success in life will be proportionate to his efforts, to his industry, to his attention to small things. Your negligent, shiftless, loose fellow never meets with luck, because the results of industry are denied to those who will not make the proper effort to secure them.

WHERE THE GOLD GOES.—A writer of mathematical bent finds from the census returns that there are about 17,000 dentists in the United States, who, he estimates, pack into the teeth of the American people a ton of pure gold annually. Continuing his speculations, he predicts that in the twenty-first century all the gold in the country will be buried in the graveyards.

GOOD HEALTH.

Slow Digestion and Acid Dyspepsia.

This, the simple and most common form of the malady, is sometimes called simple dyspepsia. It is more common in men than in women, and especially affects sedentary persons, and those nervous individuals who eat rapidly, swallowing their food without proper mastication. It is also common in persons whose teeth are defective. Its immediate cause is deficient activity of the muscular walls of the stomach and intestines, and also deficient quantity or quality of gastric juice. The symptoms are much the same as those which follow the taking of an excess of food, but are felt when only a moderate amount has been taken. An hour or two after eating a sensation of weight and oppression is felt. The discomfort continues for some hours, gradually wearing off before the next meal. The appetite is usually pretty good, but often will not be prepared for the reception of food at meal time, as the work of digesting the previous meal has not yet been accomplished. Sometimes there is considerable flatulence of the stomach, the eructations being tasteless, however, never offensive; often pain between the shoulders or beneath one shoulder-blade, and not infrequently in the region of the heart. Palpitation of the heart often occurs in the night, causing great alarm on the part of the patient and his friends, who entertain fears of sudden death. Sleep is disturbed and unrefreshing. The tongue is often foul in the morning, with a bad taste in the mouth. All the symptoms mentioned are greatly exaggerated by a late supper, or by an unusual excess in quantity or quality of food. The bowels are usually constipated, but may be regular. When the difficulty has been long continued, there will be observed a marked disposition to sleep after meals, or unnatural sleepiness at other times, and a decided loss of natural vivacity and energy.

Acid dyspepsia is that form of indigestion in which the slowness of digestion is such that the food undergoes fermentation, forming acids which irritate the stomach and give rise to the same symptoms, much exaggerated, which have been mentioned as attending slowness of digestion with several others, the principal of which are heart-burn, regurgitation of intensely sour liquid from the stomach, acid eructations, a white tongue, frequently with transverse fissures, often flabby and indented at the edges, acid saliva, causing decay of the teeth, bowels likely to be either constipated or unnaturally loose, grinding of the teeth at night, and a reddish sediment in the urine. No one patient presents all these symptoms, but more or less of them. There is quite likely also to be pain at the pit of the stomach, with soreness on pressure.

On account of the extreme slowness of digestion, farinaceous foods always aggravate this form of dyspepsia. Starchy food, sugar, fruits, and especially vegetables of all kinds, cause great increase of acidity and heart-burn. In some cases, even bread and all sorts of preparations from grains will disagree. Sugar, or any food containing it, will give rise to great distress. A meal consisting of animal food almost entirely, may be digested without difficulty, though milk frequently sours.

The digestion being very slow, portions of fermenting food remain in the stomach from one meal to another, so that acidity becomes habitual.

Patients suffering with this form of dyspepsia are usually very thin, and bloodless. Occasionally, however, we meet a case of the opposite kind, in which there is an abundance of tissue, though of a loose, flabby texture. Women suffer from acidity more than men.—*Herald of Health.*

The Nails.

The nails are structures which are very nearly like the epidermis and the hair, composed of a hard, horny matter arranged in the form of cells. They are, indeed, only altered portions of the external or epidermal layer of the skin, and rest upon their nail beds in much the same manner as the epidermis or scarf-skin lies on the true skin or derma. We speak of the root and the body of the nail—the root being that portion towards the hand which is situated beneath the skin, the body all the rest of the nail. The matrix is the bed upon which the nail rests and to which it is firmly adherent. Nails grow from the root, just as do the hairs, and only slide over their matrix or bed, so that an injury to the matrix, such as slivers beneath the nail, or run-arounds, or even a bad bruise, need not cause a disfigured nail other than of the portion directly injured; whereas, injury or disease of its root will generally cause a distorted and disfigured nail. I have seen a bruise at the root, and in one instance the sting of a bee over the root of the nail, followed by an irregularly formed nail, which lasted for a long time. Thus, also, eczema attacking the hand, may affect the ends of the fingers, or even the sides at the ends, and the nails remain perfect; but when it is located on the backs of the fingers, and involves the roots of the nails, the latter rarely if ever escape distortion and malgrowth.

Nails seldom fail to give indication of sickness which has been at all severe, by an arrest of development which has taken place in the root at the period of sickness. Some studies have been made in this direction which may not prove uninteresting or without value in the present condition, which we will quote from Mr. Wilson. A French physician, Dr. Beau, has observed that the nail of the feet are four times slower in their growth than those of the hands. The latter increase in length one-thirtieth of an inch in one week, while the nails of the toes require four weeks for the same amount of increase. According to him, the length of the thumb-nail including the root which is hidden from sight, is eight lines—that is, twenty millimeters; consequently, the period occupied in the growth of that nail would be twenty weeks, or five months. In like manner, the nail of the great toe, measuring in length nine lines and a half, or twenty-four millimeters, and requiring four times the period of the thumb-nail, would consume ninety-six weeks, or nearly two years in its growth.—*Manufacturer and Builder.*

TO MAKE court plaster, take French isinglass, 1 ounce; warm water, 1 pint; glycerine 1 ounce; tincture of arnica, half an ounce. Soak isinglass in a little warm water for twenty four hours, then evaporate nearly all the water by gentle heat. Dissolve the residue in a little proof spirits of wine, and strain the whole through a piece of open linen. The strained mass should be a stiff jelly when cool. Stitch a piece of silk or sasanet on a wooden frame with tacks or thread. Melt the jelly and apply it to the silk thinly and evenly with a badger hair brush. A second coating must be applied when the first has dried. When both are dry apply over the whole surface two or three coatings of balsam of Peru. This plaster remains quite pliable and never breaks.

A PEOPLE WITHOUT CONSUMPTION.—A paper was read recently before the Tennessee Medical Society with the title, "A People Without Consumption, and Some Account of their Country." The country in question is the Cumberland plateau. The writer, Dr. Wright, has practiced in the region throughout a generation, and in his assertion of fact touching the entire absence of consumption, he is supported by the testimony of about twenty other physicians of standing.—*Medical and Surgical Reporter.*

MINING AND SCIENTIFIC PRESS.

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SAN FRANCISCO:
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Passing Events.

The advent of the holiday season has brought with it more or less freedom from business cares to the average worker, and pleasant hours to the majority of mankind. To us in California the most welcome thing has been the bounteous rain which has generously spread all over the State to the infinite rejoicing of farmer, miner all California agrees on, the value of copious and merchant. This is one thing at least that rains to the whole country, and this week they have been generous and widespread.

The mining regions just now are more or less snow bound, except near the coast and to the southward. The mining industry generally, therefore, has little to say for itself. Still work is going on rapidly wherever it is practicable to push it.

This number closes volumne XLVII of the MINING AND SCIENTIFIC PRESS, and, as we state elsewhere in these columns, "Now is a good time to subscribe."

Before another number of the PRESS appears, the new year will have commenced. It is proper now, therefore, for us to wish our patrons a happy and prosperous New Year, and to hope they will stay with us to the end.

THE Sierra county papers say mining is being actively prosecuted in that region, and in many cases with much success. As a single sample, the Bald Mountain Extension Company cleaned up 119½ ounces of gold last week from 741 carloads of gravel. The gold is coarse, one piece weighing five ounces.

SWEETWATER, says the Bodie *Free Press*, is becoming one of the most actively prospected camps on the coast. New discoveries are frequently made, and large quantities of good ore lie on the dumps throughout the district, awaiting the erection of a custom mill.

Assaying Purchased Ores.

There has always been more or less discussion on the relative merits of crucible or scorification assays, some contending for one and others for the other. On this coast the crucible assay has been more generally favored; while in Colorado, Utah and thereabout they have inclined to the scorification assay. In such camps as have competing custom reduction works it is necessary that some standard should be set, so people engaged in the purchase and beneficiation of ore should have some regular basis to work on. In Leadville, where there are many smelting works, they have concluded that the methods of assaying and settling for ores so long in vogue are unsatisfactory, and eight of the principal smelting works have agreed to enforce certain rules, which will be of interest to all miners, as showing the practice in the largest district in the country. These rules are worthy of preservation by miners having ores to sell, as it will show what the custom is elsewhere, in a place where they have had great experience.

First. Assays shall be made by standard scorification.

Second. Moisture shall be determined by the assayers of the smelters, and no splits shall he recognized.

Third. In silver assays contents shall be noted only in full and one half ounces; that is, every fraction under one half ounce sball he left off, and every fraction over one half ounce shall also he omitted.

Fourth. Gold ores sball be noted in pennyweights only, no payments to be made for less than one-tenth of an ounce contents per ton.

Fifth. In lead assays, fractions of units shall not he noted, and no payment shall he made for less than five per cent contents per ton.

Sixth. The splitting of assays shall be discountenanced, and settlement made on smelters' assays, of within one ounce of silver, one-twentieth ounce of gold, and one per cent of lead of control assays. If a difference of more than one ounce silver, one-twentieth ounce of gold or one per cent of lead exists, the umpire sample shall be assayed.

Seventh. No person shall be allowed to serve as umpire unless in the employ of the smelting works, subscribing to these rules, or in the employ of the mine.

Eighth. In case it is necessary to employ an umpire assayer, the mine owner or manager shall have the privilege of selecting an assayer from among the smelter assayers. Should the mine owner or manager prefer to have his ore assayed by a mine assayer, then the smelter shall have the privilege of making the selection.

Mining in Mexico.

Mere speculating mining may he said to he "dead" in Mexico, that branch of the business having been greatly overdone. As a field for productive operations, Sonora is not surpassed if equaled by any other section of country in the world. A gentleman who has been over a great deal of it and had an opportunity for close personal observation, assures us of the fact. But with all its mineral wealth, the advent of railroads and the many strangers who have, during the past few years visited this State, not much has been done towards developing its mines or increasing its product of bullion. The most of these visitors have been nomadic adventurers—mere mining tramps; men who have talked a great deal with their mouths but who, for any useful purpose, have shown themselves worse than nonentities. Coming here with plausible stories of their ability to sell mines in New York, London, and the other great marts of the world, owners have been beguiled into handing their mines to them, often for long periods, only to find themselves fooled at last, the properties failing to be sold, or if sold, some latent devilment being revealed before the transaction was ended. So general now is this distrust of strangers that parties here decline longer to hand their mines except to men known to be responsible and able to handle them. For those who wish to buy mines outright this is the country for bargains. So, also, will persons desirous of securing controlling interests in mines in lieu of their opening, equipping and working them, be able here to negotiate favorable terms to that end. Where parties have the confidence of owners, arrangements of this kind can readily be effected, many Mexicans preferring in such case to retain an interest in their mines to selling the whole, even for cash.

Geology of the Comstock Lode.

A very important work has just been issued by the government entitled, "Geology of the Comstock Lode and the Washoe District," by George F. Becker. The work is a quarto of 422 pages, 7 plates and atlas of 21 sheets folio. The atlas contains a fully indexed claim map of the district; a geological map of the surface; 10 geological sections of the lode; a vertical projection of the ore bodies and maps of mine workings complete to January, 1881. The most noteworthy plates illustrate rock sections under the microscope; and these are the finest ever made, being a study to any one interested in the subject. The geology of the Comstock was examined by Mr. Becker in 1880–1, and after a long delay in the government printing office the work is now issued. The Director of the U. S. Geological Survey is forbidden by law to distribute the special reports prepared under his charge except at the price of publication, or in exchange for scientific books needed by the survey. This work costs $11., and can be procured for that sum only from the Director of the U. S. Geological Survey, Washington. The following brief statement of the principal results reached will serve to indicate the nature of the report, and to many will convey as much information as is desired:

The economical importance of the Comstock lode appears from the fact that in the twenty-one years ending June 30, 1880, a little over $306,000,000 worth of bullion has been extracted from it. Of this about $132,000,000 worth was gold. The mines are the deepest in America, reaching a distance of over 3,000 feet from the surface, and they contain about 185 miles of galleries.

Besides the scientific importance attaching to the occurrence of the immense accumulation of ore, the lode and district present other features of great interest. The nature of the rocks associated with the ores, some points of structure, and even the character of the deposit, have received different explanations at the hands of different observers. A digest of the memoirs of Messrs. von Richthofen, King, Zirkel and Church forms one chapter of the volume.

The subject of rock decomposition has received special attention in the examination described in this report. This study has led to some lithological and mineralogical observations of interest, and to the identification of all the Washoe rocks with well-established rock species. The greater part of the hanging wall of the lode is diabase; the "black dike" is also a variety of diahase, and the supposed trachyte of the district is a hornblende-andesite. The so-called propylite of Washoe comprises a number of tertiary and pre-tertiary rocks reduced to a nearly uniform appearance by decomposition. The erroneous determination of these altered rocks as an independent species arose mainly from a confusion between green and fibrous hornblende and chloride. The supposed propylites from the other districts in the United States, microscopical determinations of which have been published, were also examined and found to afford no sufficient evidence of an independent rock species.

A discussion of faulting leads to an explanation of the similarity of the shape of the west wall of the lode and the form of the adjoining face of the Virginia range. The ravines of the latter are a direct result of faulting, and are only slightly modified by erosion. A cross-section of the country on the Sutro tunnel line shows that the surface forms a logarithmic curve in accordance with the theory, which is further supported by experiments. The sheeted structure of the country seems to be referable to faulting and not to eruptive bedding. The theory leads to rules applicable in prospecting disturbed but not greatly eroded districts. The details of the topography of grassy hills are chiefly due to landslips, which come under the law of faults in a modified form, and the characteristic curves of smooth hillslopes are logarithmic.

The order of succession of rocks in the Washoe district is: Granite, metamorphics, granular diorite, porphyritic diorite, metamorphic diorite, quartz-porphyry, earlier diahase, later diahase, earlier hornblende-andesite, augite-andesite, later hornblende-andesite and basalt. Hornblende-andesite thus followed as well as preceded augite-andesite.

Chemical evidence is offered to show that the pyrite of the region is a result of the action of soluble sulphides on the ferro-magnesian silicates of the rocks. Chlorite is held to be a product of the decomposition of hornblende, augite, or mica, while epidote forms at the expense of chlorite under certain conditions, but never from feldspar. There is extremely little kaolinization at Washoe, the feldspars having yielded to another kind of decomposition. The diahase of the hanging wall when fresh was argentiferous and auriferous, and the precious metals of the lode are traced to this rock with much probability, the lateral secretion theory being thus affirmed. It is further supported by the dependence of the other ore bodies of the district on the character of the inclosing rock.

The hypothesis that the heat of the lode is due to the kaolinization of feldspar is not confirmed either by theory or experiment. On the other hand, there is much geological evidence pointing to a deep-seated source of heat, probably of volcanic origin. This conclusion is confirmed by extensive temperature observations, from which it appears that from the surface downwards the increase of heat is uniform, about 1° F. for every 33 feet, while in a horizontal direction the heat decreases in a geometrical ratio to the distance from the lode.

Experiments on the kaolinization of feldspathic rock, conducted at the boiling point of water and extending over a number of weeks, show that no heating effect due to this cause could be detected with an apparatus delicate enough to register a change of temperature of 0° 001 C.

The numerous geological sections are discussed in chapter VIII., and the application of the explanations suggested in the preceeding chapters is there shown in detail. All the important and profitable ore bodies of the Comstock, it appears, have occurred at or close to the west face of the earlier diabase, and is near that surface, and there only that exploration is at all likely to be successful. The mode of occurrence of bonanzas is considered, and hopeful prognostications are made for at least two portions of the lode; but a series of bonanzas nearly on the same level, such as was found on the east vein near the surface, is not likely to recur.

Electrical surveys were made both on the Comstock and at Eureka. At Virginia only negative results were obtained. At Eureka a distinct though small difference of potential occurs near ore bodies, and with sufficiently delicate apparatus the method might there be used for prospecting. It is believed that sulphuret ores would have given results of a more convenient magnitude than the carbonate ores of Eureka.

Close of the Volume.

This is the last number of Volume XLVII of the MINING AND SCIENTIFIC PRESS. The very complete index on the last page shows what a wide range of subjects has been treated, and how great a variety of topics have been presented to our readers. The list of patents gives the names of all Pacific coast inventors and their inventions for the past six months, and in most cases reference to the pages cited will reveal an abstract of the patent. This volume has been specially rich in engravings of an instructive and interesting character, as illustrating advance in mechanical, mining and metallurgical appliances.

The PRESS has carefully collated all the current news of the week from the mining districts and camps all over the coast, presenting them in a condensed form to save the reader's time. All new mining or metallurgical improvements which have come forward we have described in as much detail as seemed necessary.

A great deal of original matter has been gathered by our correspondents and presented to our readers. We have also compiled from technical journals all the items of mechanical and scientific progress which have seemed at all practical in their nature, and published all the local news of this character which has been obtainable.

It is the intention of the publishers to continue to improve the PRESS and maintain it in its position as the exponent of the mining and industrial classes of this coast. We have in view several series of articles of great value and interest which will shortly be commenced.

The Assay Office.*

The office should properly consist of three adjoining rooms; one in which the pulverizing, fire work, and other rough and dirty work is done; another in which to weigh and mix the assays, boil the acid in separating the gold from the silver, and keep the fluxes, acids, crucibles, spare muffles, etc.; and a third in which to keep the assay balance, books and papers. The first need not be more than ten feet square. The last may be little more than a well-lighted and dust-tight closet; the middle one should be a moderate-sized room; but it often happens that only one room can be had, and all that can be done is to make the best of it. The muffle furnace should be so placed that when the operator works in the muffle the light comes from behind him. The sun should not shine into the room. There should be a strong bench or table on which to use the pulverizing implement, and it is better if it rest on the ground, and not on the floor, so that the entire office may not be shaken by the blows of the pestle or hammer. A block, similar to that used by a butcher, will answer well instead of a table. Another table on which to place the pulp scales and mix the assays will be required. Above this table, or in any convenient situation

*This extract is from a plain practical work on "Assaying," by Chas. H. Aaron, lately issued and for sale by Dewey & Co., S. F. Price $1.

should be shelves for packages of material, and upon the table, which should be of a good size, a long box divided across into five or six compartments about six inches square and deep, and lowest in front, with a hinged cover to contain the several fluxes, etc., also the test tubes in their rack, the spirit lamp, smaller anvil, etc.

The assay scales should be so placed that the light from a window may strike them obliquely over the left shoulder of the operator while seated at his work. It is still better to have light from two sources obliquely behind the operator, in order that no shadows may be cast on the balance, either by the person or by the case frame. The sun should not be allowed to shine on the balance at any time. The table on which the balance stands should be reserved for that purpose only; there should be another on which to work with pen and paper.

Minerals on School Lands.

In the organic act establishing a territorial government for Utah, is a paragraph to the effect that when the lands in said Territory shall be surveyed under the direction of the government, preparatory to bringing them into market, sections 16 and 36 shall be reserved to be applied to schools in the Territory. This is the usual clause in such cases. The question recently came up as to whether the words of the statute impart a reservation of the grant of the sections as would require further legislation by Congress to open mineral land embraced by these sections to entry under the mining act.

In 1879, the Secretary of the Interior in deciding the question in Dakota as to the right of the U. S. to bring action for trespass on sections 16 and 36 of lands in that Territory, reserved for a similar purpose and in the same way, said: "The lands are public lands, although reserved for a partieular purpose. The United States has not granted the title to such lands, but has reserved them in order that at some future time when a State shall be erected out of such Territory the same may be granted to such State." In Mining Company vs. Consolidated Mining Company, 102 U. S. R. 167, the Supreme Court in a well considered opinion in which all legislation with reference to the manner of disposal of mineral lands and the policy of the government in relation thereto, were reviewed, held that a grant of public lands to the State of California, by the Act of March 3, 1853, for school purposes, "was not intended to cover mineral lands, but such lands were excluded from that grant, as they were from all others, by the settled policy of the government on that subject."

It appears settled then that it never was the intention of Congress to grant to a State or Territory any mineral lands for school purposes. It follows that it cannot be presumed to have been its intention to reserve any portion of them to be applied in the future to such purposes. It is proper to remark further, that since in ease of the lands in question, the United States never parted with its title, it was entirely competent for Congress to exclude the mineral portion (even conceding that a reservation of the same had been made) from such reservation, by the mining act of July 4, 1866, which construction of said act would be in keeping with the decision of Hon. C. Delano, Secretary of the Interior, April 28, 1873, in the Keystone case, the issues in which afterwards came before the Supreme Court in the ease of Mining Co. vs Con. M. Co., cited above and in keeping with the judgment of the court in that ease. Coal lands can, therefore, be taken up under the mining laws, even if in school sections.

ADVICES from Las Vegas, N. M., indicate there is great excitement among the citizens in regard to late gold discoveries. Gold is said to have been found in paying quantities on a lot at the hot springs owned by a prominent resident of Topeka a few days ago by two miners employed to assist in the excavation of ground for a new $100,000 court house. The next morning they were up with the lark staking out mining claims in the courtyard, and now the hills and valleys around Las Vegas are all swarming with excited gold-seekers, many of whom have met with success. A few years ago Elizabethtown, near Las Vegas, had a population of 5,000 gold miners, and for a number of years a company engaged in hydraulic mining, taking out $50,000 annually. There is no doubt as to the presence of gold in paying quantities. The city of Las Vegas is a mining camp, even the ladies being found among the prospectors.

WILLIAM WALKER, a furnacehand at Eureka, Nev., was Wednesday adjudged insane from the results of lead poisoning. This is the fifth man that has gone crazy from working at the lead furnaces at Eureka during the last four years.

THE Bullion of Paradise mine produced, during the time it was run by the Bullion Company, $363,098.02. The company's mill was burned recently, but they think of erecting a new one.

Graphite.

EDITORS PRESS:—Inclosed I send you a small specimen of graphite from a mine I am now developing in the northeastern portion of Fresno county, on what is called the Borer Hill, descending into Squaw valley. The vein or lode is from four to six feet wide, running almost east and west with a northeasterly dip. The ore is the best I have seen, and some time back you made mention of its probable value. I want to know where the market for it is. We have it here at home without sending to the Cumberland mine, where I see it is shipped to Loudon and sold at from thirty-five to forty shillings per pound. We can afford it for less money here if the process of separating is not attended with too much expense. I can get out a ton a day of the ore I send you. Please tell me who will buy it in mass, and what is the process of dressing and preparing it.

W. W. T.

We examined the ore sent, and considered it of rather inferior quality, which opinion has been verified by State Mineralogist Hanks, to whom the sample was submitted. Judging by its appearance only, he thinks it would not pay to do anything with. He says numbers of samples of this substance have been sent from different parts of this State to the Mining Bureau, but, without exception, they have been of poor character, and none of them showed any signs of excellence. There are specimens on exhibition there from Guerneville, Sonoma county; from Tuolumne county, Pine Flat, Sonoma county, and Wood River, Idaho, and some very fine samples from New York, Liberia and Mexico. But none of our Pacific coast graphite is worth much. Small quantities have been found which could be utilized, but no large deposits of excellence.

Plumbago (or more properly, graphite) is found all over the United States, being quite widely distributed; but as an ore to be mined, there are very few places where it is sufficiently pure or in quantities to be worked. There are several places in Colorado, Wyoming, New Mexico and Dakota, where deposits are found; and it also occurs in Pennsylvania, New Jersey, New York, Canada, Alahama, North Carolina and Virginia. Some of its deposits are of such a nature that purification of the material is impossible at figures that would make it economical. Samples of graphite have been received and reported on by the Dixon Crucible Company as follows: Big Horn, Wyoming; Pattersville, N. Y.; Los Angeles, Cal.; Portland, Penn.; Chester Springs, Penn.; Richmond, Va.; St. Johns, Newfoundland; Marlboro, N. H.; Vallecito, Cal.; German Valley, N. J.; Baltimore, Md.; York Mills, Penn.; Lancaster, Penn.; Lowell, Mass.; Eagle Bridge, N. Y.; Sidney, Nova Scotia; Mountain Creek, Ala.; Marietta, Ga.; Fort Bowie, Arizona; Waynesboro, Va.; Atlanta, Ga.; Ouray, Colo.; Salt Lake, Utah; Bloomingdale, N. J.; Mansfield, Conn.; Litchfield, Mich.; Crook City, Dak.; Silver City, Colo.; Yarmouth, Maine.

The only place in the U. S. where graphite is now mined successfully is at Ticonderoga, N. Y. This property, owned originally by the American Graphite Co., now belongs to the Jos. Dixon Crucible Co., of Jersey City, N. Y. The American Graphite Co. worked the vein deposits to a depth of 600 feet. The Dixon Co. now mine a graphitic schist fifteen feet thick, carrying from eight to fifteen per cent of graphite, practically an inexhaustible supply. Numerous attempts have been made to work similar deposits of Pennsylvania and New Jersey, but with only partial success. The parties interested in these attempts are: The Pennsylvania Plumbago Co., Eagle Plumbago Co. and Phœnix Plumbago Co., all of which have worked deposits in Pickering valley, Pennsylvania. The American Chemical Manufacturing Co., of Rochester, N. Y., which has worked the deposits in Northern New Jersey; Mr. A. Z. Ryerson, who in 1882 worked the deposit at Bloomingdale, N. J. Mines of merit are also known in Georgia.

Ore Dressing.

Several methods (both wet and dry) of dressing the ore have been attempted. In Vol. IX, page 732, Transactions American Institute of Mining Engineers, Prof. Frazer, of Philadelphia, gives a description of the process adopted in Pickering Valley. The process used by the Dixon Company, at Ticonderoga, owes its success to careful supervision. It is a wet process in which the ordinary practice is reversed, the "tailings" being the useful product. All attempts at dry concentration have failed.

Production.

The production of the Ticonderoga mine in 1882 was 400,000 pounds. Mr. John A. Walker, in a chapter on the subject of the "Mineral Resources of the U. S.," gives the probable output for all other mines in this country at 25,000 pounds, making a total output in 1882 of 425,000 pounds. In 1883 the Dixon Company arranged for an output of 500,000 pounds. The whole product this year was about 525,000 pounds. The average spot value of plumbago may be stated at eight cents per pound. Plumbago smelters are made in this city.

Kinds.

On account of the peculiar advertising it has had graphite is commercially known as German black lead, Ceylon plumbago and American graphite. German black lead is a product of Bavaria. It is of the amorphous variety, and is dressed chiefly by washing. Its price depends on its percentage of graphite and the nature of its impurities, varying from $1 to $10 per hundred weight in cargo lots. It is used to make pencils, stove polish and foundry facings. Ceylon plumbago is mined at Travancore, Ceylon, and is shipped from Columbo to all parts of the world. It occurs in immense veins of great purity. Cobbing and sizing are the only preliminary operations it undergoes. It appears in the market graded according to size, as large lumps, small lumps, chips and dust. Its price varies from $2 for dust, to $10 per hundred-weight for prime lumps in cargo lots. It is used for all the purposes of trade except the manufacture of pencil leads.

Fineness exercises considerable influence on the price of graphite, on account of the difficulty of pulverizing. American graphite is used for all purposes of the trade, and excels all kinds as a lubricant. It is the same geologically, etc., as the Canadian. Before the development of the American and Canadian mines the Ceylon mineral was the standard.

Analyses.

In 1876 the Canadian government authorized an extended survey and investigation of the comparative merit of the Ceylon and Canadian varieties. The following table of analyses of carefully prepared samples is from the report of the survey:

ANALYSES OF CANADIAN AND CEYLON GRAPHITES.

LOCALITY.	Specific gravity.	Volatile matter.	Carbon.	Ash.
		Pr. Ct.	Pr. Ct	Pr. Ct.
Canada, Buckingham; vein; variety, foliated	2.2689	0.178	99.675	0.147
Canada, Buckingham; variety, columnar...	2.2679	0.594	97.626	1.780
Canada, Grenville; variety, foliated.....	2.2714	0.109	99.815	0.070
Canada, Grenville; variety, columnar.....	2.2659	0.108	99.757	0.135
Ceylon, vein graphite; variety, columnar...	2.2671	0.158	99.792	0.050
Ceylon, vein graphite; variety, foliated.....	2.2664	0.108	99.679	0.213
Ceylon, vein graphite; variety, columnar...	2.2546	0.900	98.817	0.283
Ceylon, vein graphite; variety, foliated.....	2.2484	0.301	99.284	0.415

These analyses prove the oft-repeated claim of the dealers in Canadian and American graphite that it is equal to the best Ceylon.

Manufactures.

The properties of graphite make it useful for the following general purposes: The manufacture of refractory articles, lubricants, electrical supplies, pigments, and pencil leads. A detailed table of the articles made from it is annexed, with an estimate of the percentage used for each purpose:

PROPORTIONATE AMOUNTS OF GRAPHITE USED FOR DIFFERENT PURPOSES.

Manufactures.	Kinds of Graphite used.	Per Ct.
Crucible and refractory articles, as stoppers and nozzles, crucibles, etc.....	Ceylon, Am.....	35
Stove polish.....	Ceylon, Am., Ger.	32
Lubricating graphite.....	Am., Ceylon.....	10
Foundry facings, etc.....	Ceylon, Am., Ger.	8
Graphite greases.....	American	6
Pencil leads	Am. and Ger	3
Graphite packing.....	Ceylon, Am	3
Polishing shot and powder	Ceylon, Am	2
Paint.....	American	½
Electrotyping.....	Am., Ceylon.....	½
Miscellaneous—piano action, photographers', gilders', and hatters' use, electrical supplies, etc	.....	1
		100

The earliest use of graphite was for pencil leads. La Moine cites a document of 1387 ruled with graphite. Its use for this purpose has become so extended that in 1882 over 15,000,000 pencils were made in the world. Previous to 1827 black lead crucibles were made only in Germany. In that year the late Joseph Dixon began their manufacture in this country, using graphite from New Hampshire. He afterward saw samples of Ceylon plumbago, and appreciating its value he secured a shipment from Ceylon in 1829. This was the first importation of Ceylon plumbago into this country. Since that time its use has steadily increased. In the fiscal year 1882, 16,047,100 pounds of plumbago were imported, most of which was from Ceylon; the rest from Germany.

Graphite has long been used as a lubricant. This is one of the most useful applications, and one which promises most for the future. Formerly it was offered to the engineer only in the form of a dry powder; now it is compounded or mixed with fats and oils in many ways, some of which are patented. This use of graphite is attracting the attention of all interested in the problem of the reduction of friction, and promises to outstrip all others. The barriers which have prevented its extensive use in this direction have been the price and the difficulty of securing purity and freedom from all grit. These are now both overcome, the price being now less than 25 per cent of what it was 15 years ago. The purity, which is now absolute, was then only approximate. For all heavy work graphite is undoubtedly the lubricant of the future.

The growth of the graphite industry has kept pace with the age, each new development in metallurgy and engineering offering some new field of usefulness for graphite. For instance, it furnishes the pots for the manufacture of cast steel, and the nozzles and stoppers used in the Bessemer process. It it used in the manufacture of electrical supplies, etc. Fifty years ago graphite was little known and misnamed; now it is of constantly increasing importance. From an insignificant beginning in the present century, the industry has grown to its present proportions.

The principle houses engaged in the graphite industry are as follows:

Joseph Dixon Crucible Company, J. H. Gautier & Co., Jersey City, N. J.; Phœnix Crucible Company, Taunton Crucible Company, Willard & Lane, Taunton, Mass.; R. Taylor & Co., Scidell & Co., Ross & Co., H. A. Bartlett & Co., Phœnix Mining Company, Philadelphia, Penn.; A. W. Faber, Eagle Pencil Company, American Lead Pencil Company, Cutter & Brown, New York City; Variety Iron Works, Cleveland, Ohio; S. Obermayer & Co., Cincinnati, Ohio; Morse Bros., Canton, Mass.; J. L. Prescott & Co., North Berwick, Me.; American Chemical Manufacturing and Mining Company, Rochester, N. Y.; Ransom & Co., Albany, N. Y.; W. H. Colebrook, Syracuse, N. Y.; G. A. Moss, Lustro Company, New York City; I. X. L. Stove Polish Company, Grand Rapids; A. Z. Ryerson, Bloomingdale, N. J.

The New Copper Assay.

[Written for the PRESS by C. H. AARON.]

The presence of a little ammonium chloride seems to favor the clearing of the liquid, yet this clearing was less perfect in some trials than in others, the cause of which remains to be ascertained. I think too great an excess of ammonia is injurious. A great quantity of ammonium chloride makes the liquid too dense, causing the precipitate to float. The stirring should be quite active, but not so violent as to cause frothing. The effect of a change of 20 or 30 degrees of temperature may cause a difference of one-half or more per cent in the result, as it causes the float to rise in the burette to the extent of half a c. c.

I do not find it necessary to use a veruier graduated float, as my burette, though only graduated to half c. c., drops 20 to the c. c. without perceptible variation from top to bottom.

I have operated, so far, on 100 milligrammes of pure copper for standardizing, and 200 of ore for the assay. Euargite, from Alpine Co., gives me 46.33 per cent copper. Dana gives 45.95 per cent. (Root's analysis); Mr. A. K. Brewer, of Tucson, assayer, finds 46.3 per cent by electrolysis.

By standardizing on a larger quantity of copper, using also stronger solutions, and a correspondingly larger quantity of ore, there will be, I think, no difficulty in getting results accurate to one-tenth of one per cent, or even closer.

The assay may be made on a neutral, an alkaline, or a slightly acid solution (it may be strongly acid with acetic acid), but in acid or neutral solutions, zinc, cobalt and nickel would interfere if present. Arsenic is harmless. I have not found it necessary to use a standard solution of copper for backworking, but great care is needed to avoid overshooting the mark with the zanthate.

The assay might be made in precisely the same manner as the humid assay of silver, with a normal and a decime solution of the zanthate in place of salt. In this case an approximative assay might be made by the cyanide process, and such a quantity of the ore taken as should contain a little less than a certain quantity of copper.

The method seems to be exceptionally adapted to the assay of alloys of copper, such as brass. It remains to be seen how long the zanthate will retain its virtue, but it will certainly do so for some weeks, and is not troublesome to prepare, though smelling disagreeably. I hope soon to have another new assay perfected.

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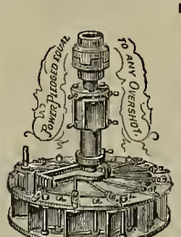
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Ingersoll, D2 3", beat Rand 3⅛"	.744	" "
Ingersoll, D2 3", beat National 3⅛"	.505	" "
Ingersoll, E 3½", beat Rand 3⅛"	.560	" "
Ingersoll, E 3½", beat National 3⅛"	.321	" "
National beat Rand	.139	" "

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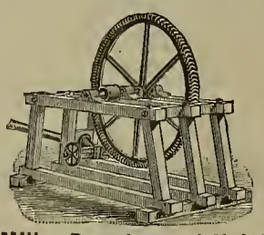
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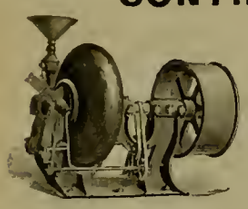
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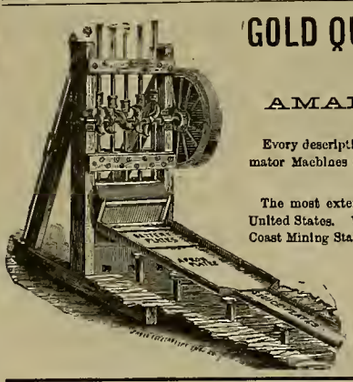
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List of U. S. Patents for Pacific Coast Inventors.

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289,800.—FARM GATE—S. Q. Barlow, Petaluma, Cal.

289,899.—MOTOR—C. De Mezerville, Santa Clara, Cal.

290,003.—CABLE GRIP APPARATUS—Dods & Hindes, Virginia City, Nev.

289,900.—PROTECTING IRON WATER PIPES—F. Eaton, Los Angeles, Cal.

289,904.—MOVING STREET CARS ON CURVES—N. A. Fisher, Sacramento, Cal.

289,836.—OBTAINING BORACIC ACID FROM NATIVE BORATE OF LIME—J. B. Hobson, S. F.

289,915.—GRAIN SEPARATOR SHOE—A. H. Johnson, Woodland, Cal.

290,063.—STEAM ACTUATED VALVE—H. Kessler, S. F.

289,844.—HAND STAMP—C. A. Klinkner, S. F.

290,873.—LOCKING DEVICE FOR WHIP SOCKETS—A. H. Lau, S. F.

289,866.—SAFETY BRIDGE FOR RAILROAD CARS—A. B. Smith, S. F.

289,937.—BASIN AND WATER CLOSET VALVE—H. Smith, S. F.

290,131.—HONEY COMB PACKING BOTTLE—S. M. Smith, S. F.

289,942.—PORTABLE FRUIT LADDER—L. H. Titus, San Gabriel, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise), at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

"Square the Year."

There are not many customs we care to borrow from the Chinese, but there is one excellent one they have of settling up all their accounts at the end of each year, that it would be handy to have grafted on to our Western civilization. For instance, it would be of great assistance to the publishers of this journal to have all its patrons renew their subscriptions promptly, save the expense of collections, avoid the changing and shifting of the position of the names on the printed mail list, and prevent some of the chances of errors occurring in addressing and mailing our very large list of subscribers. We, therefore, kindly urge upon all those who possibly can to renew their subscriptions early.

This is an excellent period for all not paid in advance to remit and place their credit ahead for 1884. Verily every enterprising publisher holds at a premium his list of promptly paying patrons. We hope our friends will not delay forwarding their postal orders because a single subscription is small in amount. We need the support of every intelligent person interested in the objects to which our paper is devoted. It is the interest of all such that the PRESS should be well sustained.

We have endeavored in every way to make these issues so valuable to its readers as to make it almost indispensable. No man can read it who will no likely find at least in one or more copies during the year, something worth many times the subscription price.

Mining Share Market.

The holidays and partial cessation of business of the stock boards has made the share market duller than usual this week. Nothing special has transpired in the mines either to help the market along. On the Comstock, at the north end, work is progressing favorably at all points. After following some ore streaks to the eastward a distance of 24 feet, by means of a crosscut from the east station of the 3100 level of the Sierra Nevada, they have now started the regular north drift. At the middle mines operations have been a good deal delayed during the week by the breaking of the rod of the Cornish pump at the Chollar-Norcross-Savage shaft. The break has been repaired, however, and all is now progressing favorably. At the Imperial they have now but 100 feet to go to reach the old upper levels. They have been doing excellent work in this drift, as the rock was very hard and all has been done by hand drilling. A good feature is that the drift needs no timbering, and will stand for all time without giving any trouble or calling for repairs. At Gold Hill many miners have been laid off on account of the low stage of water in the Carson river, but this is merely a temporary difficulty.

IF YOU want a lubricant that will run any thing cool write CHARLES J. WOODBURY, GENERAL MANAGER LUBRICATING DEPARTMENT CONTINENTAL OIL AND TRANS. Co., for "Lubrice." It is the best compound grease in the market. Shipped in 5, 10 and 25-pound cans, half barrels and barrels. Warranted to give satisfaction. Observe the numbers: No. 2 is soft for outside work; No 3 is medium soft; No. 4 is medium hard; No. 5 is very hard, where unusual lubrication is demanded. Send for Catalogue of Lubricating Oils

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions The pavilion has new varieties of performances. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AMT.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Andes S M Co	Nevada	23	25	Nov 10	Dec 20	Jan 9	B Burris	309 Montgomery st
Autumn M & M Co	California	1	2	Dec 22	Jan 29	Feb 18	J M Buffington	309 California st
Acme M Co	California	7	5	Dec 22	Jan 29	Feb 18	J M Buffington	309 California st
Baker Divide M Co	California	8	20	Dec 5	Jan 7	Jan 28	W G Hughes	330 Pine st
Boston Con M Co	California	5	25	Nov 21	Dec 24	Jan 14	F E Luty	330 Pine st
Bodie Con M C	California	4	50	Dec 21	Jan 30	Feb 29	G W Sessions	309 Montgomery st
Bullion M Co	Nevada	23	20	Nov 16	Dec 18	Jan 7	J N Brazell	320 Montgomery st
Caledonia M Co	Dakota	14	10	Oct 21	Dec 13	Jan 11	W L Oliver	328 Montgomery st
Columbus Con M Co	Nevada	1	25	Nov 5	Dec 10	Jan 3	J M Buffington	309 California st
Day S M Co	Nevada	14	30	Dec 1	Jan 7	Feb 5	E M Hall	327 Pine st
Eastern Quicksilver M Co	California	2	10	Dec 7	Jan 15	Feb 4	F A Berlin	420 Montgomery st
El Dorado Con M Co	Nevada	1	05	Dec 4	Jan 7	Jan 23	J H Sayre	330 Pine st
Eureka Tunnel Co	Nevada	2	50	Nov 9	Dec 10	Jan 11	J Pardy	Eureka, Nevada
Golden Fleece G M Co	California	31	—	Dec 12	Jan 16	Feb 4	F Schirmeier	783 Folsom st
Gould and Curry S M Co	Nevada	46	50	Nov 7	Dec 12	Jan 3	A K Durbrow	309 Montgomery st
Gold Lead M Co	Nevada	4	5	Nov 9	Dec 17	Jan 8	J Bronzan	328 Montgomery st
Hale & Norcross M Co	Nevada	73	50	Nov 17	Dec 21	Jan 14	J F Lightner	309 Montgomery st
Holmes M Co	Nevada	8	1.00	Dec 26	Jan 29	Feb 19	C T Bridge	224 California st
Independence M Co	Nevada	12	20	Dec 1	Jan 4	Jan 28	J W Pew	310 Pine st
Loreto M and M Co	Mexico	5	50	Dec 5	Jan 7	Jan 24	H G Jones	327 Pine st
Massachusetts Con M Co	California	1	10	Dec 4	Jan 12	Jan 31	A C Hammond	Merchants Ex.
Mexican G M Co	Nevada	25	50	Dec 26	Jan 38	Feb 20	C E Elliott	309 Montgomery st
Martin White M Co	Nevada	17	25	Dec 24	Feb 7	Mar 7	J J Scoville	309 Montgomery st
Mayflower Gravel M Co	California	21	10	Nov 26	Dec 27	Jan 15	J Morizio	328 Montgomery st
Northern Belle	Nevada	1	50	Nov 30	Jan 1	Jan 28	W Willis	309 Montgomery st
Original Keystone M Co	Nevada	7	30	Nov 21	Dec 22	Jan 10	F E Luty	330 Pine st
Pinal Con M Co	Arizona	5	10	Dec 15	Jan 23	Feb 15	A Adler	309 Montgomery st
Santa Anita M Co	California	6	1	Dec 22	Jan 29	Feb 18	J M Cuffington	309 California st
Tohongo M Co	California	1	30	Dec 18	Jan 23	Feb 16	J L Fields	330 Pine st
Wide Awake M Co	Arizona	17	20	Nov 17	Dec 28	Jan 28	C Hildebrandt	320 Sansome st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Argenta M Co	Nevada	B M Hall	327 Pine st	Annual	Jan 14
Bullion M Co	Nevada	J M Brazell	328 Montgomery st	Annual	Jan 10
Con Virginia M Co	Nevada	A W Havens	309 Montgomery st	Annual	Jan 10
California M Co	Nevada	C P Gordon	309 Montgomery st	Annual	Jan 16
Iowa M Co	California	C C Leavitt	510 Battery st	Annual	Jan 8
Mountain M Co		B E Henrickson	213 Mission st	Annual	Jan 7
Silver King M Co	Arizona	J Nash	328 Montgomery st	Annual	Jan 8

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Bulwer Con M Co	California	W Willis	309 Montgomery st	15	July 2
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	Dec 24
Idaho M Co	California			4.00	Dec 2
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	Dec 19
Mt Diablo M Co	Nevada	R W Heath	318 Pine st	25	Nov 26
Standard Con M Co	California	Wm Willis	309 Montgomery st	Two of 25	Dec 12
Silver King M Co	Arizona	J Nash	315 California st	25	Dec 15

Sales at San Francisco Stock Exchange

THURSDAY A. M., Dec. 27.

600 Alta	1.20@1.25	200 Yellow Jacket	2.15@2.10
50 Alpha	1.35	AFTERNOON SESSION.	
650 Argenta	05c	520 Alta	1.25@1.30
1600 Bodie Con	80c	50 Alpha	1.15
100 B. & Belcher	2.30	100 Andes	50c
20 Belcher	1	220 Best & B	3
200 Chollar	2.65@2.70	740 Bodie	85c@1.05
100 Con. Virginia	30c	200 Bodie Isle	20c
50 California	10c	200 Benton	25c
100 Crown Point	90c	570 Chollar	2.70@2.75
200 Day	20c	50 Exchequer	35c
200 Exchequer	35c	380 Gould & Curry	2.05
700 Grand Prize	20c	150 Hale & Nor	2.15@2.1
750 Hale & Nor	2.35	100 Justice	25c
100 Justice	25c	300 Mexican	2.10@2.15
560 Mexican	2.10	180 Northern Belle	20c
200 N. Belle Is	35c	50 Navajo	3.35
20 Ophir	3.95	160 Ophir	4
65 Overman	15c	50 Occidental	1.30
550 Potosi	1.20	1100 Potosi	1.10@1.2
235 Sierra Nevada	3.15	1250 Savage	1.15
530 Savage	1.15	485 Sierra Nevada	3.20@3.1
10 Utah	1.50	20 Silver King	3
300 Union Con	2.75@2.80	100 Union	2.80
		50 Yellow Jacket	2.40

San Francisco Metal Market.

[WHOLESALE.

THURSDAY, DEC 27, 1883.

ANTIMONY—Per pound		14 @	15
IRON—American Pig, soft, ton		30 00 @	—
Scotch Pig, ton		24 00 @	28 50
American White Pig, ton		28 00 @	32 50
Oregon Pig, ton		— @	—
Clipper Gap, Nos. 1 to 4		32 50 @	35 00
Rennel Bar		3½ @	3½
Horseshoes, keg		5 50 @	—
Nail Rod		7½ @	—
Norway, according to thickness		6½ @	7
STEEL—English Cast, lb		14 @	15
Black Diamond, ordinary sizes		14 @	—
Drill		15 @	16
Machinery		12 @	14
COPPER—Ingot		22 @	—
Braziers' sizes		31 @	—
Fire-box sheets		31 @	—
Nails		17 @	—
Bolt		31 @	—
Old		8 @	—
Bar		— @	—
Cement, 100 fine		12 @	—
LEAD—Pig		4½ @	4½
Bar		5½ @	6
Pipe		7 @	—
Sheet		8 @	—
Shot, discount 10% on 500 bags: Drop, ½ bag		2 10 @	—
Buck, ½ bag		2 30 @	—
Chilled, do		2 50 @	—
TIN PLATES—Charcoal		6 00 @	6 50
Coke		5 50 @	5 75
Banca Tin		24 00 @	—
Australian		21 50 @	—
I. C. Charcoal Roofing, 14x20		6 50 @	6 80
ZINC—By the cask		12 @	—
Sheet, 7x3 ft, 7 to 10 lb, less the cask		9 @	10
NAILS—Assorted sizes		3 30 @	4 75
QUICKSILVER—By the flask		34½ @	34½
Flasks, new		1 05 @	—
Flasks, old		85 @	—

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $4 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turning a leaf.

Bullion Shipments.

Alvord, Dec. 11, $1,500; Idaho, 17, $6,536; Christie, 19, $757; Richmond Con., 19, $20,478; Paradise Valley, 18, $4,406; Grand Prize, 21, $9,000; Navajo, 21, $10,031; Alice, 18, $18,903; Stormont, 18, $3,100; Hanauer, 18, $7,800; Vienna, 28, $3,085; Ontario, 18, $8,339; Horn Silver, 18, $1,800; Hanauer, 19, $3,129; Crescent, 19, $2,210; Vienna, 19, $1,444; Ontario, 19, $3,830; Horn Silver, 19, $12,000; Hanauer, 20, $2,681; Vienna, 20, $1,556; Ontario, 20, $3,614; Horn Silver, 20, $12,000.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Dec. 5.		WEEK ENDING Dec. 12.		WEEK ENDING Dec. 19.		WEEK ENDING Dec. 26.	
Alpha	.70	.90	1.00	1 05	....	1.00	1.35	
Alta	.75	1.05	.95	1.35	1.30	1 55	1.20	1 40
Andes	.20	.30	.20	.50	.45	.50	.45	.50
Albion	....	....	....	.10	....	....	....	.30
Argenta	....	....	....	.05	....	.05	....	....
Atlas	....	....	....	....	....	....	....	....
Belcher	.80	.90	.90	1.05	.85	.90	.90	.95
Belding	....	....	....	....	....	....	....	....
Best & Belcher	2.25	2.75	2.00	3.00	2.50	2.75	2.25	3.05
Bullion	.20	.25	....	.30	....	.45	.55	.60
Bechtel	....	....	....	....	....	....	....	....
Belle Isle	....	.30	....	.30	....	....	....	.25
Bodie Con	.75	.95	.75	.90	.75	.80	.75	1.00
Benton	.05	.15	15	.25	.20	.25	.20	.25
Bodie Tunnel	....	....	....	.35	....	....	....	....
Caledonia	....	.15	....	.15	....	....	....	....
California	.15	.25	.15	.25	....	.10	.10	.15
Challenge	....	.15	....	....	....	....	....	....
Chollar	1.55	1.90	1.70	2.25	2.00	2.20	2.25	2.65
Confidence	.70	.90	.80	.85	....	1.00	....	1.00
Con. Imperial	....	....	....	.05	....	....	....	....
Con. Virginia	.25	.35	.30	.35	.25	.30	.25	.35
Crown Point	.60	.75	.90	1.10	....	.80	....	.90
Day	....	.30	....	....	....	.30	....	.20
Elko Con	....	.20	....	.10	....	.20	....	.20
Eureka Con	2.95	3.45	2.75	3.50	3.00	3.25	2.25	2.60
Eureka Tunnel	....	....	....	.55	....	....	....	.55
Exchequer	.20	.30	.30	.40	....	.30	.30	.35
Grand Prize	.20	.30	.25	.30	....	.25	.20	.25
Gould & Curry	.85	1 15	.80	1.80	1 50	1.65	1.60	1.95
Hale & Norcross	.70	1 10	.85	1.30	1.00	1.45	1.60	2.05
Holmes	1.00	1.10	....	....	....	....	.50	.95
Independence	....	....	....	....	....	....	....	....
Julia	....	....	....	.05	....	....	....	....
Justice	.15	.25	.25	.35	.30	.35	.25	.35
Jackson	....	....	....	....	....	....	....	....
Kentuck	....	....	....	....	....	....	....	....
Martin White	....	....	....	....	....	....	....	....
Mono	....	.15	....	....	....	....	.40	....
Mexican	1.70	2.30	1.90	2.50	....	2 10	2 00	2.35
Mt. Diablo	2.60	3.10	2.75	.90	1.95	2.20	1.25	1.75
Mt. Potosi	....	....	....	....	....	2.40	....	....
Noonday	....	....	....	....	....	....	....	....
Northern Belle	.80	1.40	.15	.50	....	....	.15	.20
North Noonday	....	....	....	....	....	.20	....	....
Navajo	3.70	3.75	3.25	3 65	....	....	3.40	3.45
North Belle Isle	....	....	....	....	3.45	3.55	....	.35
Occidental	....	.75	1.70	1.95	....	.45	....	1.15
Ophir	5.75	5½	7.00	8.50	....	1.00	3.95	4.90
Overman	....	.15	.20	.35	7.50	17.00	....	.25
Oro	....	....	....	....	.20	.25	....	....
Potosi	.50	.80	.75	1.05	.90	.95	.95	1.30
Pinal Con	....	....	....	....	....	....	....	....
Savage	.15	.70	.70	1.00	.80	.95	.90	1.10
Seg. Belcher	....	....	....	1.25	....	....	....	....
Sierra Nevada	2.15	2.70	2.25	3.85	2 60	3.25	2.80	3.35
Silver Hill	....	....	....	....	....	....	....	....
Silver King	7.00	7 75	....	75	....	....	....	7.75
Scorpion	.35	.40	.35	.50	.35	.40	....	.40
Tuscarora	....	....	....	....	....	....	....	....
Union Con	2.20	2.80	2.40	3.40	2.45	3.05	2.50	3.05
Utah	1.05	1.60	1.25	1.85	1 50	1.70	1.50	1.85
Ward	....	....	....	....	....	....	....	....
Wales	.20	.30	.20	.25	....	....	....	....
Yellow Jacket	1.50	1.95	1.60	2.20	1.65	2.00	1.75	2.10
	....	....	....	....	....	....	....	....

W. E. CHAMBERLAIN, JR. T. A. ROBINSON.

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Will insure a hearty appetite and increased digestion.

Cures general debility, and gives a new lease of life.

Dispels nervous depression and low spirits.

Restores an exhausted nursing mother to full strength and gives abundant sustenance for her child.

Strengthens the muscles and nerves, enriches the blood.

Overcomes weakness, wakefulness, and lack of energy

Keeps off all chills, fevers, and other malarial poison.

Will infuse with new life the weakest invalid.

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Mrs. L. F. GRIFFIN.

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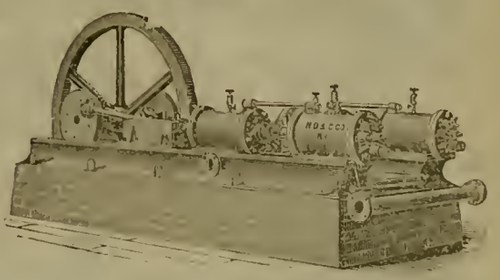
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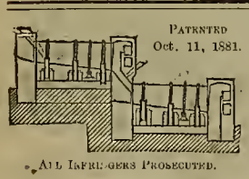
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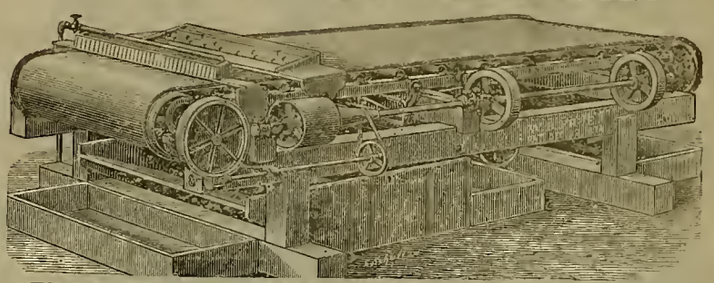
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—OR—

VANNING MACHINE.

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A machine can be seen in working order, and ready to make tests, at the office of Hinckley, Spiers & Hayes, 220 Fremont Street.

To those intending to manufacture or purchase the so-called "Triumph" Concentrator, we herewith state:

That legal advice has been given that *all shaking motion* applied to an *endless traveling* belt used for concentration of ores is an infringement on patents held and owned by the Frue Vanning Machine Company

That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.

That the patent laws make *users* of infringements responsible as well as makers, and the public is therefore warned that there is considerable risk in purchasing any end-shake machine until our various patents have been decided.

That if there are those who for any reason prefer an end-shake machine, we can manufacture and sell to such machine of that description, as efficient as the Triumph, and at a lower price, and no liability for infringement will then be incurred by the purchaser.

That we shall protect ourselves against any one making, selling or using any machine infringing any of our patents. Patented July 9, 1867; May 4, 1869; Dec. 22, 1874; Sept. 2, 1879; April 27, 1880. Patents applied for.

That we are, and have been, ready at any time, to make a competitive trial against the Triumph, or any other machine, for stakes of $1,000.

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NOTICE IS HEREBY GIVEN, that at a meeting of the Board of Directors, or Trustees, held on the 5th day December, 1883, an assessment of five dollars ($5.00) per share (being balance of 44th and part of 45th installments) was levied upon the capital stock of this corporation, payable immediately to the Secretary at the office of the Company, 318 Montgomery St., San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 7th day of January, 1884, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on TUESDAY, the 12th day of February, 1884, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors.

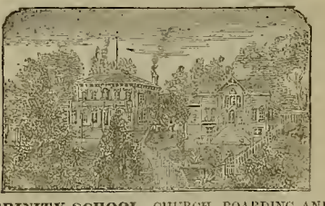
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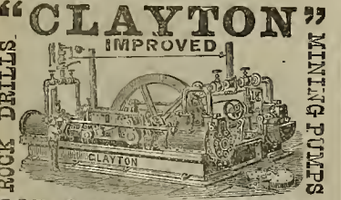
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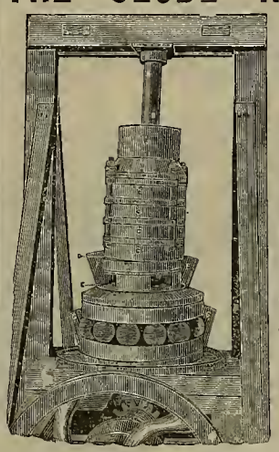
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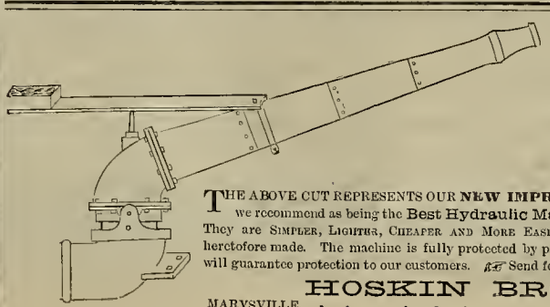
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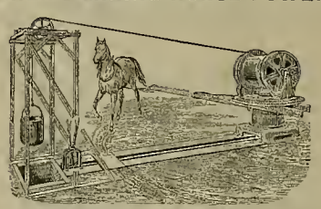
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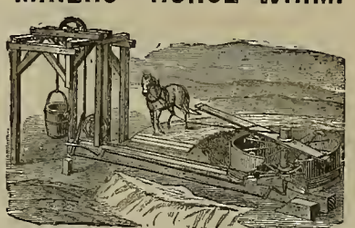
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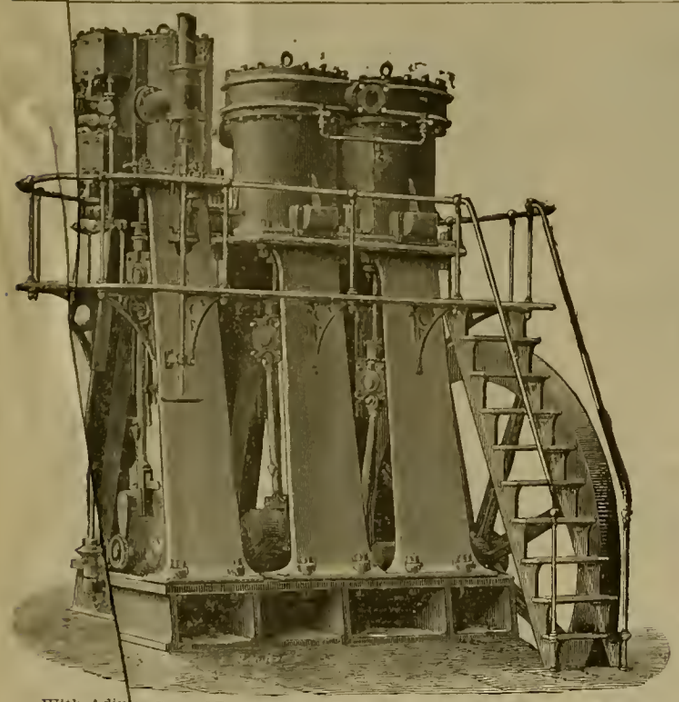

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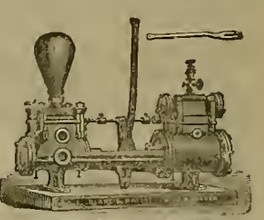


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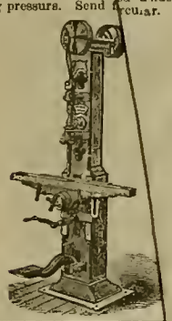
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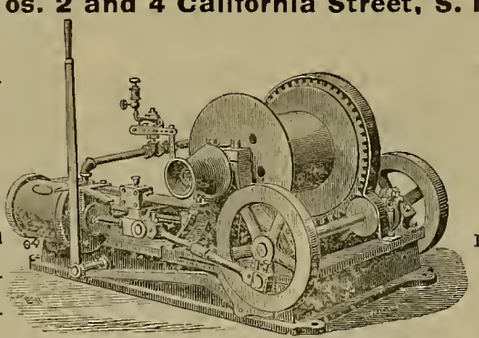


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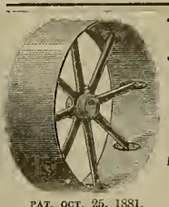
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